Tenth National Conference on Standards

SPECIAL ISSUE

THE MAGAZINE OF

Standards

the Howard Coonley Medal award . . . page 364

DECEMBER 1959

THE MAGAZINE OF

Standards

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

VOL 30 DECEMBER, 1959 No. 12

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The Front Cover: A scene at the National Conference on Standards—Vincent dePaul Goubeau (left), who was awarded the Howard Coonley Medal for 1959, is congratulated by Major General J. B. Medaris (center) and ASA President John R. Townsend (right).

Published monthly by the AMERICAN STANDARDS ASSOCIATION INCORPORATED, 70 East Forty-fifth St., New York 17, N. Y. Subscription rates: Companies in U. S. and possessions, $7.00 per year; in other countries, $8.00. Public libraries, schools, and government agencies, in U. S. and possessions, $6.00 per year; in other countries $7.00. Re-entered as second class matter Jan. 25, 1954, at the Post Office, New York, N. Y., under the Act of March 3, 1870.

This publication is indexed in the Engineering Index and the Industrial Arts Index.

Opinions expressed by authors in THE MAGAZINE OF STANDARDS are not necessarily those of the American Standards Association.

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• THIS SPECIAL ISSUE on the Tenth National Conference on Standards can give you only a general idea of the constructive discussions and interesting information on standards in many different fields presented during the eight technical sessions.

The Conference is presented in capsule form because we believe it is important that all readers of the magazine have an opportunity to view the Conference as a whole. We are equally certain that it is important for all readers of the magazine to follow up this bird's-eye view by adding the published Proceedings of the Conference to their personal libraries, and to go further into the ideas that were presented by checking what the speakers actually did say. Most of the papers contained information that will bear further study and adaptation in each individual's own experience.

This year's published Proceedings will include the discussions that followed a number of the sessions, in addition to the text of the papers.

Copies are $4.00. Write the American Standards Association for further information, or to order your copy.

• A SIGNAL HONOR to a good friend was inadvertently omitted from the report of the annual meeting of the Standards Engineers Society in the November issue. Warm congratulations are in order for S. P. Kaidanovsky who received the ASTM-SES award for "outstanding contributions to the literature on standards." Mr Kaidanovsky is well known as contributor to THE MAGAZINE OF STANDARDS several years ago of a series of articles on government standards, and recently of a number of book reviews. He was author of a series of articles on materials standards and specifications published in *Materials in Design Engineering* last year and is editor of the Management Science Series of the Reinhold Publishing Corporation. He is also Professor of Management at the Graduate School of Business Administration, New York University.

• THE 1959 INDEX to THE MAGAZINE OF STANDARDS is being published as Part 2 in January 1960.

• PUT THIS DATE on your 1960 calendar now and arrange without fail to be at the Eleventh National Conference on Standards — October 25-27, 1960—Sheraton-McAlpin Hotel, New York, N. Y.

This Month's Standards Personality

DR A. V. ASTIN, director of the National Bureau of Standards, has been called the man who wants to measure tomorrow. Under his supervision the Bureau maintains the primary measuring instruments that make possible today's highly precise industrial measurements. It is looking to the needs of tomorrow in the many research undertakings through which it expects to develop instruments and methods that will make those of today look like child's play. As demonstrated in the Bureau's exhibit at the National Conference on Standards in Detroit, use of atomic radiations as the basic standard of length is already within sight.

This is only one of the changes that will result from the Bureau's work in the next few years. The challenge of space, calling for precision never before imagined, pushes scientists to find answers to performance of materials under hitherto unheard-of conditions. Under Dr Astin's direction, the National Bureau of Standards is studying and finding answers to these problems.

Dr Astin joined the staff of the National Bureau of Standards in 1930 as a research associate. He had been graduated from New York University with a Master of Science degree in 1926, and took his Ph.D. in Physics in 1928. From 1928 to 1930 he spent at Johns Hopkins University as a National Research Council Fellow. He advanced through the various grades at the Bureau, as associate physicist, 1932-1936; physicist, 1936-1942; senior physicist, 1942-1944; assistant chief of the ordnance development and electronic division, 1945-1948; chief of the electronic division, 1948-1950. In 1951 he became associate director of the Bureau and in 1952, director.

Dr Astin's reputation as one of the country's outstanding scientists was earned in three fields primarily—research on measurement techniques related to insulation; pioneering work in development of telemetering (basis for much of the meteorological and cosmic ray study of the upper atmosphere), and work on proximity fuzes during World War II. Dr Vannevar Bush credits the Bureau project on fuzes as second only to the atomic bomb in deciding the outcome of the war.

Dr Astin's contributions to science were recognized in 1953 by Lehigh University and in 1958 by George Washington University which gave him honorary Doctor of Science degrees. One of his principal characteristics, integrity, was recognized in the 1958 citation, which called him a "persistent investigator whose philosophy does not accept the statement often made that 'the disproving of fact supporting a beautiful purported hypothesis is a tragedy!' To him it is a challenge that leads to truth."

Dr Astin holds the King's Medal (England) and the President's Certificate of Merit. He is informal in manner, friendly, and casual. Although he works long hours at the Bureau, he finds time to do some gardening, to play bridge, and is known as a do-it-yourselfer, who has repapered his house during vacation. He has always cordially supported the friendly and cooperative relations maintained by the National Bureau of Standards and the American Standards Association.

Mayor Louis C. Miriani of Detroit (right) joins Dr George H. Brown (left), vice-president of engineering, Radio Corporation of America, and Roy P. Trowbridge, GM Engineering Standards Section, General Motors Corporation, in examining the National Bureau of Standards' exhibit at the National Conference on Standards. Mr Trowbridge was chairman of the Conference Program Committee.

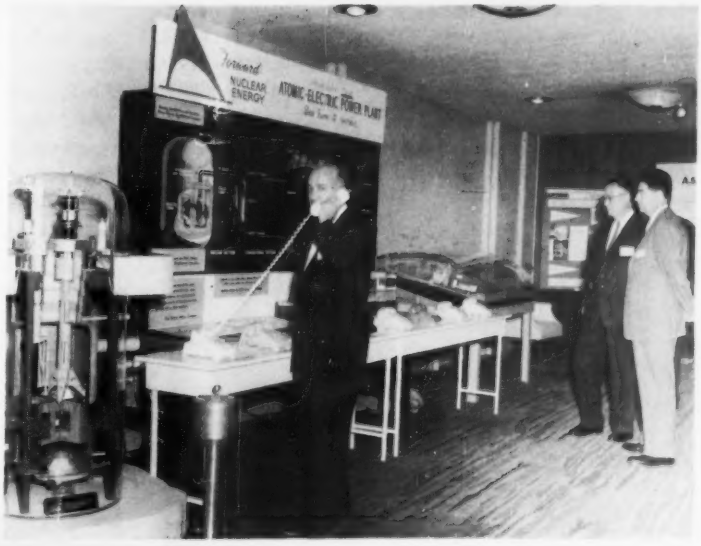
The TENTH NATIONAL CONFERENCE ON STANDARDS

THE TENTH NATIONAL CONFERENCE on Standards opened in Detroit October 20 with a welcome by Detroit's Mayor Louis C. Miriani. This was the first time a national conference on standards had been held in Detroit, the city recognized throughout the world as the site of the automotive industry's pioneering work in standardization and mass production. The meeting was held for three days, October 20-22, ending with a series of tours that made it possible for those present to view some of the pioneering developments for the future.

Standards in space technology, value analysis in purchasing, and the relative merits of the inch and metric systems for United States industry were among the subjects discussed. Highlights of the conference were presentation of the Howard Coonley Medal and the Standards Medal, and an address at the Awards Dinner by Major General J. B. Medaris, Commanding General of the Army Ordnance Missile Command, on "Standards for Survival."

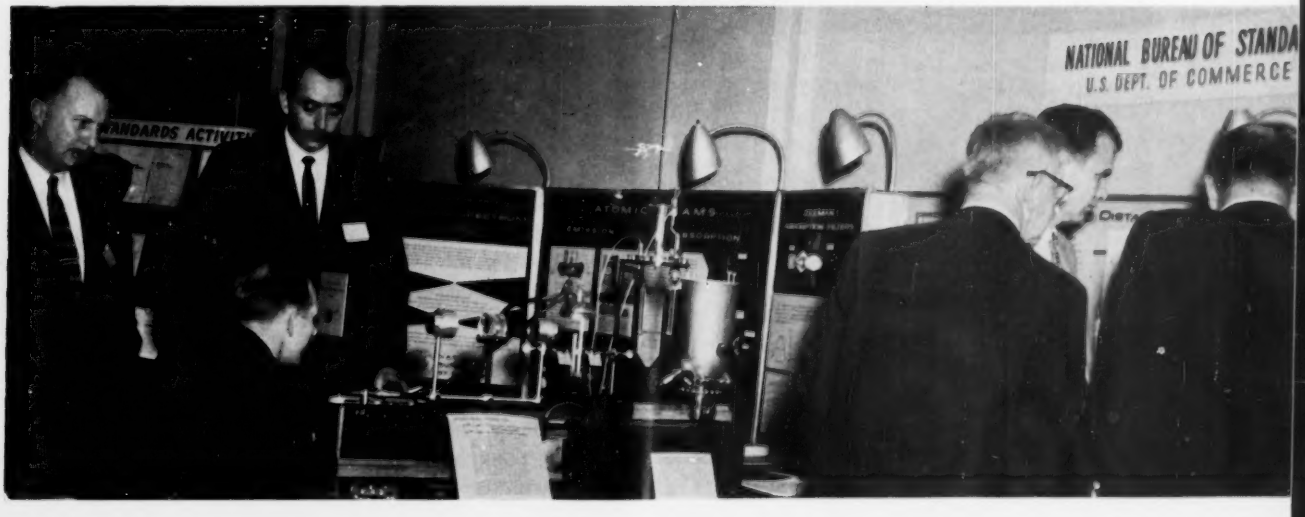
Many of the sessions featured subjects of interest to auto men—highway standards, machine tool standards, fastener standards, materials handling standards. Roy P. Trowbridge, director of General Motors' engineering standards section and member of ASA's Standards Council, was general chairman of the meeting. He pointed out that most of the subjects discussed covered basic areas of standardization in every industry.

The chairman and secretary of the Detroit Chapter of the Standards Engineers Society with the National Bureau of Standards' Publications Director, (left to right) Arthur S. Colton, American Society of Tool Engineers, Detroit Chapter secretary; C. W. Straitor, Detroit Edison Co, Detroit Chapter chairman; William R. Tilley, National Bureau of Standards.



RIGHT: Detroit Edison's exhibit, showing how Michigan's first atomic-electric power plant will work, aroused a great deal of interest. Here, a pre-conference visitor listens to the recorded explanation.

BELOW: Conference visitors studied the National Bureau of Standards' exhibit showing how the wave-length of the orange light of Krypton 86 can be used as the standard of length. This is the proposed international standard, subject to final adoption by the International Conference on Weights and Measures in 1960.



SESSION 1

TOP: ASA's president and vice-president discuss the National Bureau of Standards' exhibit with Detroit's Mayor, Louis C. Miriani. Mr Miriani welcomed the National Conference on Standards to Detroit. (Left to right) John R. Townsend, ASA president; Mr Miriani; Frank H. Roby, ASA vice-president.

BOTTOM: Ralph H. Isbrandt (left), American Motors Corp, conference keynote speaker, with Mayor Miriani and Vice Admiral G. F. Hussey, Jr, ASA's managing director.

Opening Session

JOHN R. TOWNSEND, president of the American Standards Association, opened the meeting. Remarking on the recent international agreements on basic measurements, he pointed out that the Army, Navy, and Air Force are now being instructed to adopt the International Yard and Pound in scientific activities.

Mr Townsend believes that one of the principal problems for the U.S. is the length of time it takes to convert the ideas of scientists into actual "hardware" ready for use. The thief of time is decision-making, he pointed out, and standards here offer the answer to the recurring problem.

Standardization — Keystone of Industrial Progress, theme of the conference, was the title of the keynote address by R. H. Isbrandt, director of automotive engineering and research, American Motors Corporation. Mr Isbrandt is chairman of the Technical Board of the Society of Automotive Engineers. The development of the automobile was hampered by absence of standards around the turn of the century, Mr Isbrandt pointed out. The first industry standards, covering spacing of tire lugs and holes, rim sections, and lamp brackets, were drawn up in 1902 by the Mechanical Branch of the Association of Licensed Automobile Manufacturers (ALAM). SAE's first standards committee was formed in 1910. SAE adopted the ALAM Standards in 1911. Since then, SAE Standards have been indispensable to the growth of the automobile industry, Mr Isbrandt pointed out. SAE is now actively reviewing the need for standards in a number of relatively new fields including missiles, aerospace, and electronic computers.

ASA and SAE have had a long and pleasant association in development of standards, Mr Isbrandt noted. Only by voluntary acceptance of a mutually developed standard, as provided under ASA's basic philosophy, can stagnation in design be prevented, he said.

Also speaking at the opening session, Dr George H. Brown, vice-president of engineering, Radio Corporation of America, described the way in which the industry's standards for black and white and color TV were agreed upon. The FTC regulations covering basic elements of the TV system do not include mention of equipment, he pointed out. Flicker characteristic has been one of the most important considerations in setting the standard for broadcasting TV signals, Dr Brown explained. The ability of the eye to see flicker had to be studied before the number of pictures per cycle could be standardized. In Europe, he said, the TV industry uses 50 pictures per cycle. This causes a flicker that is noticeable to Americans. The U.S. industry has standardized on 60 pictures per cycle. However, scanning the lines that make up the picture is done at only one-half the speed originally proposed. First, the odd lines are scanned at 30 lines per second; then the even lines at 30 lines per second. This is called interlaced scanning. The operation is so fast that the eye seems to be seeing 60 lines in the second and no flicker results

Charles M. Wright, staff engineer for standards, Chrysler Corp, chairman of Session 2, (center) with other members of the panel (left to right) A. C. Doty, Automobile Manufacturers Association, Session 2 vice-chairman; Joseph Gurski, Ford Motor Company; Mr Wright; Kenneth A. Stonex, GM Proving Grounds; Ralph Bertsche, Jr, GMC Truck and Coach Division, General Motors.

SESSION 2

Automotive Industry Experience with Various Aspects of Standardization

Sponsor: Automobile Manufacturers Association

RALPH BERTSCHE, JR, chief electrical engineer, GMC Truck and Coach Division, General Motors Corporation, urged more adequate representation at meetings of international working groups. There has been a tendency, he said, to concentrate on representation at the larger meetings. However, by the time the proposed standard reaches the main committee, opinion is often jelled to the point where it cannot be changed, he pointed out. Even a casual interchange of ideas at the working level can be valuable, Mr Bertsche believes. In his opinion there should be better communication between the technical societies and associations and the delegates. Often, he declared, delegates are handicapped by inadequate committee work and European proposals may be rejected without adequate study to determine the value of the proposals.

Committees working under the procedures of the American Standards Association often are heavy on the producer side, in the opinion of Joseph Gurski, manager, Chemical and Metallurgical Laboratory Service, Ford Motor Company, Dearborn, Michigan. Consumers have a lesser voice in the work of these committees and are not so well organized, he said. The American Standards Association will grow and prosper as it gives services that are desired, Mr Gurski declared. He recommended that ASA give service to industry by compiling an index of the standards available in the U.S. He pointed out that industry and national standards complement each other, as each performs functions the other needs. Industry standards that cross industry lines and those standards in which government has an interest could be considered national standards, he suggested.

An examination of highway construction, even of turnpikes, shows that there is a lack of safeguards which would not be tolerated in any modern industrial operation, declared Kenneth A. Stonex, assistant director, General Motors Proving Grounds.

As a result, he said, highway accidents are far higher than necessary. For instance, in 1958 the injury-accident rate on the New York Thruway was 26.28 per 100 million miles, while on other New York highways and streets it was more than 300. This compares to only 15 injury accidents for nearly 65 million test miles driven on automotive proving grounds where much higher safety standards are observed.

Mr Stonex used the accident-prevention experiences of the private road system of the GM proving grounds as examples of ways in which current highway safety problems might be solved.

Using a motion picture of the proving ground tests, he stressed the danger of obstacles on the immediate roadside, the effect of drainage ditches, and the slopes of the roadside.

Roadside design offers the best opportunity for improving highway safety, Mr Stonex finds. Tests at the GM proving grounds show that a certain percentage of off-road accidents will occur, he explained, even under the controlled conditions of the test course. Therefore, it is important to provide roadside designs that will lessen the effects of the off-road accident. As a result of the proving ground tests, new designs for guard rails, for lamp posts, for side-of-the road grading, and for traffic signs have been suggested. Trees should be removed from the roadside and planted farther back out of the way of out-of-control cars, the tests have indicated. Deep ditches should be removed and rounded ditches provided. Signs should be mounted at 60 inches instead of the 42 inches specified in the current American Standard Manual of Uniform Traffic Control Devices, he believes.

A great deal of research still needs to be done before the ultimate in roadside design can be established as a standard, Mr Stonex declared. However, rapid progress is being made in development of engineering and regulatory standards in highway engineering and traffic control.

William H. Gourlie demonstrates a point on the blackboard as several other panel members look on. (Left to right) Harry W. Robb; W. G. Waltermire; Mr Gourlie; Harvey F. Phipard.

SESSION 3

Fastener Standards Can Save Money

Sponsor: Industrial Fasteners Institute

FASTENER STANDARDS AND SPECIFICATIONS should be based on the end properties desired rather than on material analysis or production methods, declared R. B. Belford, technical advisor, Industrial Fasteners Institute, Cleveland. Since Mr Belford was U.S. delegate at the meeting of ISO/TC 2, Bolts and Nuts, in Milan, Italy, October 20-23, his paper was read for him.

Industry uses 100 billion bolts, nuts, screws, and rivets every year, Mr Belford pointed out. Thus large savings accrue to industry when standards concentrate on the end use of the fastener, he declared.

"The foremost development in bolt standards is a proposal to establish a hexagon head bolt with the lower height, or thickness, of the regular hexagon head, but with the width of the present heavy head series," W. G. Waltermire, chief product engineer, Lamson & Sessions Company, told the Conference.

The proposed new series would establish a high-strength structural bolt with a wider head, providing enough bearing area so that no washer would be needed. "A heavy hexagon head bolt could be used, but the extra head height would add unnecessarily to the cost," Mr Waltermire explained. He said that Sectional Committee B18, Subcommittee 2, is considering a proposal to revise the present heavy hexagon, heavy semifinished hexagon, and heavy finished hexagon series. Also, the subcommittee is considering dropping the minimum size from ½ to ¼ inch.

Replacement in mechanical standards of square head bolts and nuts by hexagon head bolts and nuts would benefit the national economy, in Mr Waltermire's opinion. The hexagon shape is more economical to manufacture, he explains; as a change-over is completed, repair mechanics can simplify their tools; and equipment producers can eliminate the use of a variety of shapes and wrench sizes.

Mr Waltermire also pointed out that changes in bolt length tolerances will be included in the next revision of American Standard B18.2-1955.

An ambitious research program, which will be reported by the U.S. Tapping Screw Service Bureau, is being undertaken by Subcommittee 3 of Sectional Committee B18, said Harvey F. Phipard. Mr Phipard is director of research and engineering, Continental Screw Company, New Bedford, Mass. The research is expected to develop a specification for higher strength tapping screws to be checked by a uniform torsion test. Much of the work for this project has already been done and the first reports should be forthcoming before the end of this year, Mr Phipard reported.

An even more ambitious research program, which will probably take two to three years, has been set up to develop drive/strip tests, he said. These tests will simulate the assembly and indicate the way in which the screw will perform in use.

Subcommittee 3 of Committee B18 has just approved specifications for a new gage for controlling the rounding of corners on hex head and hex washer head screws, Mr Phipard reported.

Among future changes in standards for nuts predicted by Robert L. Riley, Bethlehem Steel Company, are establishment of an optimum nut-testing method; development of load-distribution and stress-behavior data on nuts; elimination of the "regular" series of standard nuts; changes in terminology of the two remaining series; and simplification of nut styles.

"It is time to remove the regular series from the American Standard," Mr Riley said. Use of the series is discouraged in the present edition in the ¼-inch to ⅝-inch sizes, he pointed out, and in sizes over that there is little difference between the "regular" and "finished" series.

He suggested that two series, one labeled "thin wall"

and the other "thick wall," be included in the next revision of the American Standard. In addition, he suggested that in the ¼-inch to ⅝-inch range the standard include only the double-chamfered style.

High-strength bolts have almost completely replaced rivets in building and bridge construction, pointed out Edward R. Estes, Jr, American Institute of Steel Construction. The ready acceptance of this construction technique in the eight years since it was introduced can be attributed to the confidence placed by architects, engineers, and building code officials in the organizations that drew up the standards and specifications for this type of construction, in Mr Estes' opinion.

In 1951, the Research Council on Riveted and Bolted Structural Joints issued its specification for high-strength steel bolts, Mr Estes pointed out. The specifications have been endorsed by the American Institute of Steel Construction and the Industrial Fasteners Institute. Materials conform to specifications of the American Society for Testing Materials, and dimensions conform to American Standard requirements, he said.

For the future, Mr Estes predicted that working strength of high-strength bolts will be increased. "Other research has shown it may be possible to eliminate the washer in high-strength bolt assemblies," he added. "It may be that in another eight years the rivet will be as much a rarity in the shop as it is today in the field."

Unified screw thread standards are now so widely accepted that complete interchangeability of threads has almost been reached, said W. H. Gourlie, standards engineer for the Sheffield Corporation, and chairman of Sectional Committee B1, Screw Threads.

"The new revision solves a major problem that has been a horrible nightmare for screw thread designers," Mr Gourlie said. "At one time, one could list more than 12 methods actively in use for checking external threads. And of those 12 methods, no two gave the same answer under varying conditions, as normally encountered."

To solve the problem, Mr Gourlie explained, a number of accepted practices are listed in the new revision, to insure a uniform end result in thread sizes throughout industry.

The previous edition of the American Standard on screw threads included two series of thread design, the American National screw thread and the Unified screw thread. These were not interchangeable, and were in fairly equal use in industry. In the ten years since that edition was published, Mr Gourlie pointed out, the Unified thread has been adopted by almost all industries. As a result, only the Unified thread is included in the 1959 revision of the American Standard, although the American National thread is described in an appendix. The new revision, Mr Gourlie concluded, provides "a common screw thread standard for all engineering in the USA."

Buyers of fasteners should not ask for a specific grade of raw material but should specify the physical properties of the product with as few limitations on materials as possible, said H. L. Hopkins, chief engineer, the National Screw & Manufacturing Company, Cleveland. This will result in faster delivery of the highest quality product consistent with the lowest cost, he said. He showed tables of SAE and ASTM standards.

Very few fastener manufacturers make a complete line of all fasteners through the entire size range, he explained. One manufacturer, predominately strong in rivets, will probably have a good stock of 1008 steel, while another, strong in the machine screw field, may have 1015 steel available. Either grade of material meets the specifications of SAE Grade 0, he explained.

"The really fundamental approach to the economical selection of fasteners is not how many nuts and bolts you can purchase for your dollar, but how many pounds of holding power you can purchase for your dollar," Fred E. Graves of Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N.Y., pointed out. Mr Graves listed six easy ways to save money on fasteners: (1) Standardize on coarse threads to a Class 2A external fit or a Class 2B internal fit; (2) standardize on the use of bolts or cap screws in place of stud and nut combinations wherever possible; (3) standardize on three or four head styles for machine screws and on hex head bolts rather than square head; (4) have bolt materials specified as to physical properties necessary for their functional requirements rather than specifying chemical analysis; (5) try to standardize on commercial zinc-plated fasteners; (6) standardize on the high-strength cap screw or bolt, rather than combinations of machine bolts, bright cap screws, and high-strength cap screws.

Chatting before Session 3 on fasteners (left to right) H. L. Hopkins; Fred E. Graves; Edward R. Estes; James A. Boxall.

The Session 4 panel (left to right) Bernard Better; Clyde L. Fanning; John Rotchford, Raytheon Manufacturing Company, session chairman; Kenneth Stoll; George J. McLaughlin; Arthur S. Colton, American Society of Tool Engineers.

SESSION 4

ASTE and Its Engineering Standards

Sponsor: American Society of Tool Engineers

AMERICAN INDUSTRY is needlessly paying out millions of dollars every operating day because of lack of standardization and because of duplication of attempts to standardize, according to George J. McLaughlin, standards head, Manufacturing Engineering Division, Grumman Aircraft Engineering Corporation. Mr McLaughlin urged standards engineers to make known any proposal for standards they have in mind; to work with standards organizations in developing the proposed standard; and to make use of American Standards already available. There is tremendous personal satisfaction in launching a standards proposal, he declared.

"It is time our standards program became less the result of happenstance and expediency and more the fruit of deliberate plan — based on sound standardization philosophy and carried out by organized industry effort," declared Kenneth Stoll, equipment designer, Equipment Development Plant, Sylvania Electric Products, Emporium, Pa. "There are few fields of productive endeavor where we are falling behind more certainly or more dangerously than in industrial standardization," he said. "We will not be victorious in any economic race while the need for standardization of an activity often precedes by years the development and approval of an effective standard."

Mr Stoll cited lack of standards for tapped holes as costing industry millions, in spite of excellent American Standards for screw threads and taps. Length of screw threads for machine screw applications in various materials, and shaft-size/key-size relationships are other examples of industry practice that should be standardized, according to Mr Stoll.

"There is no justification for present duplication of engineering effort in activities where practical standards can supply this as an engineering service," Mr Stoll said. "If there is a best method for an activity, industry is guilty of gross neglect until it does something about standardizing the practice."

For many years there has been a need for a national standard covering spindle noses for boring mills and similar machine tools, declared Bernard Better, research director, Scully-Jones Company. National standards are needed for many other types of machine tools and fittings, Mr Better pointed out. However, he pointed to a number of problems. "Some manufacturers may feel that they have such a strong grip on the present market that they need not alter their product to meet the new standard," he said. "They may have a proprietary product covered by strong patents and feel they would lose a strong competitive advantage should a national standard be set up."

Several important tool standardization projects are now being studied intensively by various chapter committees of ASTE, Mr Better pointed out. The ASTE chapter standards committees, both in the USA and in Canada, revise, review, recommend, and prepare proposals for tool standards.

Technical societies have unique facilities for drafting national standards because they have an already-established communications system that provides a direct means of finding qualified people and provides a clearing point for collected information. This was the opinion of C. L. Fanning, vice-chairman of the national standards committee of ASTE. Mr Fanning is assistant chairman, Engineering Shops Department, General Motors Institute.

ASTE has more than 100 local chapters with standards committees that are working on new standards or reviewing present standards for possible revision, Mr Fanning said. He outlined the steps taken by ASTE in drawing up a standard, and listed the standards on which ASTE chapters are working. The final step is to request the American Standards Association "to set up a sectional committee or a subcommittee in conformance with its procedure for approval of a standard as American Standard."

SESSION 5

Good Standards + Good Purchasing Techniques = Increased Profits

Sponsors: National Association of Purchasing Agents, and Company Member Conference of ASA

STANDARDIZATION THROUGH VALUE Analysis, a concept of the National Association of Purchasing Agents, is providing many corporations with tremendous savings, William D. Schelbe told the conference. Mr Schelbe is director of purchases, Wolverine Tube Division, Calumet & Hecla, Inc, Alcan Park, Mich. As an example, Mr Schelbe said, standardizing on a single brand name may simplify upkeep and reduce inventory, but such a step cuts off the purchasing agent from opportunities for value analysis. He might then miss the opportunity to discover a much less expensive piece of equipment that could do the job just as well.

As an example of the way standards can benefit the purchasing agent, Mr Schelbe cited the case of copper tubing used in refrigeration equipment. For many years, ⅜-inch outside diameter tube with 0.035 wall thickness was standard. Improved manufacturing processes now make possible much thinner walls. As a result, manufacturers are ordering a number of sizes ranging from 0.015 up to 0.022, and outside diameters deviating slightly from ⅜ inch. The industry is now working to standardize on two or three sizes.

"If we are successful in doing this one job on tubing," Mr Schelbe said, "we will be able to reduce the tooling required, run bigger lots, simplify our testing and inspection procedures, and improve our delivery service, thus cutting our production costs. These savings will be shared ultimately by the consumer."

Purchasing's responsibility is to use the standards already developed, not duplicate work already being effectively performed, said E. Philip Kron, assistant director of purchases, Eastman Kodak Company, Rochester, N.Y. It has been no easy job to sell purchasing men on standardization, he said, but the National Association of Purchasing Agents' Standardization Committee has presented the story in various ways, showing that use of standardization by purchasing men would benefit their companies, their suppliers, and themselves.

Value analysis is now recognized as closely related to standardization. In 1958, the NAPA Standardization Committee became the Value Analysis-Standardization Committee, or VASCO.

Mr Kron showed a film "Value Analysis-Standardization — The Open Door to Increased Profits," and suggested that others use the film to interest management in value analysis and standardization, to train the operating and staff personnel in these concepts, to acquaint suppliers with these principles, and to provide the sales department with additional knowledge and insight in how to deal effectively with purchasing agents of other companies. The film provides a visual explanation of value analysis-standardization techniques; shows how these techniques may be applied; and demonstrates the value of scientific purchasing procedures in over-all company operations.

H. R. Wurster, director of purchases, Wyandotte Chemicals Corporation, Wyandotte, Mich., presented slides on value analysis — how it works.

Every dollar saved in purchasing is worth $14.30 in sales, Mr Wurster declared. At this ratio, effective purchasing can mean the difference between profit or loss to most manufacturers, he pointed out. Purchasing agents or buyers can put value analysis to work by finding out from the engineer more about the purpose of the material he is requisitioning, the time involved, and many other details. Thus he may save money for the company by grouping an order from one division with that of another, by unitized packaging or pallet loading, by obtaining an item from another division of the company, or by scheduling shipment to coincide with a supplier's production program.

Mr Wurster showed slides illustrating the value analysis methods used by his purchasing department.

Ready to show how good standards and good purchasing techniques improve profits (left to right) Harry R. Wurster; E. Philip Kron; William D. Schelbe; Wilbur J. Pierce, purchasing department, Detroit Edison Company, session chairman. J. M. Goldsmith, chairman of the Company Member Conference, and vice-chairman of the session, is standing.

VINCENT deP. GOUBEAU
Recipient of the Howard Coonley Medal
October 21, 1959

CITATION: As a leading expert on materials and purchasing, and as an executive of a great American corporation, he has been an untiring advocate of the indispensable function of standardization in all phases of industrial activity. A recognized leader in the field of voluntary standards for more than 20 years, he has brought an appreciation of standards to the National Association of Purchasing Agents. As an executive supporter of the NAPA National Standardization Program, he has played a key role in making standards one of the major tools of the purchasing agent. An authority in the field of materials management and control as well as of standardization, he has contributed many articles to business and management publications and is in constant demand as a speaker before business groups. Through these activities he has done an outstanding job of advancing understanding and acceptance of voluntary standards among many industries and professions. As an executive of Radio Corporation of America, he has constantly been active in promoting standardization in the electronics industry. As a director of the American Standards Association and of the National Association of Purchasing Agents, he has served the voluntary standards movement on a nation-wide and world-wide basis with vision, distinction, and achievement.

THE MEDAL

THE HOWARD COONLEY MEDAL was presented to Vincent dePaul Goubeau, vice-president and director of materials, Radio Corporation of America, at the Awards Dinner, October 21. William L. Barth, retired head of engineering standards, General Motors Corporation, and executive secretary of its standards committee, was awarded the Standards Medal.

Mr Goubeau was honored for his "key role in making standards one of the major tools of the purchasing agents." Through his articles and speeches, the citation points out, "he has done an outstanding job of advancing understanding and acceptance of voluntary standards among many industries and professions."

Mr Goubeau served during World War II as chief of procurement, Navy Department. He is a director of the American Standards Association, and has been a director of the National Association of Purchasing Agents.

The Howard Coonley Medal is awarded each year to an executive who has rendered great service in advancing the national economy through voluntary standards. Howard Coonley, for whom the medal was named, was president and chairman of the board of the Walworth Company, and served for 22 years on the board of directors of the American Standards Association. He was the first president of the International Organization for Standardization. Mr Coonley was the

MAJOR GENERAL J. B. MEDARIS, Commanding General, U.S. Army Ordnance Missile Command, as principal speaker at the Awards Dinner, discussed "Standards for Survival." "I want to acknowledge the debt of the Army for the indispensable contributions you have made to the national effort over the years since the American Engineering Standards Committee was organized in 1918," he said in his opening remarks. "No small part of the Army's success in coordinating American industrial production in three major emerg-

THE HOWARD COONLEY MEDAL

Awarded each year to an executive who has rendered great service in advancing the national economy through voluntary standards.

1959 AWARDS

first recipient of the medal. Others who have received the Howard Coonley Medal are: Herbert Hoover, William L. Batt, Ralph E. Flanders, Thomas D. Jolly, Harold S. Osborne, Frederick S. Blackall, Jr, Roger E. Gay, and John R. Suman.

THE STANDARDS MEDAL is awarded to an individual who has served the voluntary standards movement through leadership in the actual development of standards. William L. Barth was honored for "his technical ingenuity and persuasive leadership . . . in the development and wide application of such American Standards as those concerning screw threads, threaded fasteners, drafting practices, and washer and machine rings."

Mr Barth formerly represented the Automobile Manufacturers Association on the Mechanical Standards Board of ASA. He has served, in some cases as chairman, on 49 sectional committees and subcommittees of ASA, often as a representative of the Society of Automotive Engineers. He also served as an advisor to the American-British-Canadian Conferences on the Unification of Engineering Standards.

Others who have received the Standards Medal are: Paul G. Agnew, Frank O. Hoagland, Perry L. Houser, John Gaillard, James G. Morrow, M.B.E., Charles Rufus Harte, John R. Townsend, William P. Kliment.

WILLIAM L. BARTH

Recipient of the Standards Medal

October 21, 1959

CITATION: His technical ingenuity and persuasive leadership are responsible for many outstanding achievements on all levels of the voluntary standards movement. As executive secretary of the General Motors Standards Committee and head of the Engineering Standards Section, he administered and coordinated the extensive standardization program of this company. As a member of five standardization committees of the Society of Automotive Engineers, he has made many valuable contributions to the standards of the automotive and allied industries. On the national level, he has been one of the most active participants in the development of such important American Standards as those for screw threads, threaded fasteners, drafting practices, and washers and machine rings. Over the past 25 years, he has been a member of eight sectional committees of the American Standards Association and of 41 subcommittees and subgroups. For many years, he was a member and chairman of ASA's Mechanical Standards Board. On the international level, he was active in the American-British-Canadian Conferences on Unification of Engineering Standards. He was instrumental in promoting acceptance of the Unified Screw Thread, and he is still active in guiding efforts to achieve common drafting standards of the English-speaking nations. The sum of his standards work represents major engineering achievements and economic progress.

encies has been due to the effective application of meaningful standards which helped to assure reliable and efficient materiel of war."

At a press conference preceding the dinner, General Medaris commented on his retirement from the Army. He would like to make some contribution to education, where he believes so much is at stake, he said. His speech was received with enthusiasm by those present at the dinner. To give it wide circulation, it is published in full on pages 374-377 of this issue.

THE STANDARDS MEDAL

Awarded annually to an individual who has shown leadership in the development and application of voluntary standards.

SESSION 6

Standards and Safety Codes in Material Handling

Sponsor: American Society of Mechanical Engineers

DISCUSSING THE NEW AMERICAN STANDARD on pallet sizes,[1] which has just been published after five years of committee work, J. E. Wiltrakis, Western Electric Company, Kearny, N.J., stressed the vast field of application of this new standard. This recently achieved standardization of pallet sizes is expected to result in major economies in packing, storing, and distribution of goods, he said.

In addition to describing the new standard, Mr Wiltrakis discussed the philosophy of materials handling. In his opinion, materials handling and data processing are closely interrelated and should be studied as a single system. By making packaged units of components and assemblies in standardized sizes suitable for assembly, handling, and storage by standardized materials-handling devices, he believes automation of materials and data flow can be facilitated.

Mr Wiltrakis calls for specialists in the field of materials handling and distribution to provide solutions for distribution problems, possibly by using the systems approach and by planning distribution systems today that will provide for the needed flow of standardized equipment and materials tomorrow. Breakthroughs in new techniques and methods that will solve many of the problems of distribution are imminent, he believes.

[1] An article by Mr Wiltrakis on the new American Standard Pallet Sizes, MH1.1-1959, has been published in the November issue of THE MAGAZINE OF STANDARDS, pages 332-334.

Many companies are spending millions of dollars on captive container systems with little regard to interchangeability with other systems, H. H. Hall, consulting engineer of Pittsburgh, told the conference.

"The need for an integrated system of freight containers suitable for universal interchange between different modes of transportation is urgent," he said. To provide the needed standard interchangeable sizes for such a system, a project has ben set up under the procedures of the American Standards Association. This shipping container work is being handled by Sectional Committee MH5, of which Mr Hall is chairman. The committee is working on three separate categories of containers, Mr Hall explained: pallet containers, small containers corresponding in general size to palletized unit loads; cargo containers, medium-size containers, usually of rugged construction for outdoor handling; and van containers, demountable highway truck or trailer bodies.

The goal is establishment of modular standard sizes and uniform handling and securing methods, both nationally and internationally. With these, pallet containers would fit efficiently in van containers, and all types of containers would be interchangeable between marine, rail, highway, and air carriers. Mr Hall described some of the problems facing his committee, and the status of its work to date.

The use of statistical methods would help to establish

TOP OF PAGE: Gordon Webster, W. P. Kliment, and Russell Hastings go over points on safety standards in materials handling, discussed by Mr Webster and Mr Hastings during Session 6. Mr Kliment, engineer of standards, Crane Company (center), was chairman of the session.

LEFT: Pallet sizes and containerization are important contributions to U.S. economy, said J. E. Wiltrakis (left) and H. H. Hall (far right). W. P. Kliment (next to Mr Wiltrakis) was chairman of the session. W. G. Waltermire, Lamson & Sessions Company (next to Mr Hall) was vice-chairman.

realistic safety standards in materials handling, Gordon L. Webster, Faculty Member, Production Engineering, General Motors Institute, Flint, Mich., suggested. To apply statistical methods, he suggested that materials-handling equipment manufacturers classify defects and set standards of safety reliability both in performance and maintenance. This method might be applied to establishment of maintenance practices commensurate with a stated risk or standard of reliability, he said.

As an example, Mr Webster suggested, "Let's assume that a product has a mean failure of 100 hours and a standard deviation of 5 hours. Our knowledge of the normal curve then permits stating the probability of failure at various time intervals. For instance, the probability of failure in 100 hours is 50 percent; in 95 hours 16 percent; in 90 hours 2½ percent; and in 85 hours 0.15 percent. Thus we can specify the desired risk or reliability standard and make replacements or repair accordingly."

"Would not an approach such as this permit establishing safety reliability standards and make for more effective maintenance procedures?" he asked.

The growth in the number of types of conveyors — from 16 to 71 in ten years — was one of the reasons for the extensive revision of the American Standard safety code for conveyors, cableways, and related equipment, said Jervis C. Webb, president, Jervis C. Webb Company.

The revised code, approved by ASA in 1957, takes into account the increasing use of conveyors in automated plants, Mr Webb said. He is chairman of the American Standards Association's sectional committee that drew up the code.

The code was enlarged to include every type of conveyor listed in American Standard Conveyor Terms and Definitions, B20.1-1957, which was published after the previous edition of the safety code. For complex conveyor systems, a provision for spotting trouble immediately by means of a master panel is included, making it unnecessary to search through the entire system to find the danger area. A traffic control system for aerial tramways is included also, Mr Webb said.

Safety as applied to fork lift and similar industrial trucks was the subject discussed by Russell Hastings, assistant to the vice-president, Industrial Truck Division, Clark Equipment Company, Battle Creek, Mich.

SESSION 7

New Horizons in Standards

Sponsor: ASA Standards Council

Officers of Session 7 and session speakers meet informally before the start of the session (left to right) Dr J. P. Hagen; Alvin G. McNish; T. E. Veltfort, Copper and Brass Research Association, chairman of ASA's Standards Council, and chairman of Session 7; W. A. McAdams; J. W. McNair, ASA, vice-chairman of the session.

STANDARDIZATION IN THE FIELD of atomic energy faces a unique problem in meeting codes and regulations at all levels of government, W. A. McAdams, manager, industry standards, General Electric Company, declared.

In most industries, Mr McAdams explained, standards have been developed gradually over the years, and then accepted by government agencies as part of their codes and regulations. For the first ten years of the atomic energy industry, 1944 to 1954, the Federal Government held a tight monopoly. As a result, for reasons of national security and safety, extensive regulatory controls have been established. Hundreds of legislative and administrative proposals in this field have been acted upon by federal, state, and local governments. The development of standards in the traditional manner has thus been made most difficult.

"Internationally, the situation is equally complex," Mr McAdams said. "The International Atomic Energy Agency, the International Labor Organization, the European Nuclear Energy Agency, the Euratom Community, and other international federations are beginning to draft international treaties covering matters which should preferably be the subject of international standards first. Typical examples include the proposed ILO convention on radiation protection of workers and the

proposed IAEA convention on transportation of radioactive and special nuclear materials. Both of these have been drafted in the last few months. It is likely to be extremely difficult to prepare international standards which will be acceptable to all of these international bodies after they have each, separately, promulgated their own rules."

Mr McAdams pointed out that the Nuclear Standards Board and eight sectional committees have been established under American Standards Association procedures to meet the urgent need for voluntary industrial standards in the field.

These committees are:

N2. General and Administrative Standards for Nuclear Energy. *Sponsor:* Atomic Industrial Forum

N3. Nuclear Instrumentation. *Sponsor:* Institute of Radio Engineers

N4. Electric Apparatus and Systems for the Nuclear Field. *Sponsors:* American Institute of Electrical Engineers; Electric Light and Power Group; National Electrical Manufacturers Association

N5. Chemical Engineering for the Nuclear Field. *Sponsor:* American Institute of Chemical Engineers

N6. Reactor Safety Standards. *Sponsors:* American Nuclear Society; American Society of Mechanical Engineers

N7. Radiation Protection. *Sponsors:* Atomic Industrial Forum; National Safety Council

In addition to the American Standard Glossary of Terms in Nuclear Science and Technology, N1.1-1957, a number of standards are now in various stages of development, he pointed out. Several are nearing completion as proposals for consideration. Among these are: Radiation symbols, N2; Radiation exposure records systems, N2; Canned motor pumps for nuclear applications, N4; Reactor containment vessels, N6; Reactor site safety evaluation, N6; Reactor classification, N6; Casual criticality prevention, N6; Uranium mines and concentrators, N7.

The American Standards Association holds the secretariat for the project on nuclear energy of the International Organization for Standardization, and for its Subcommittee 1 on Terminology. Three other subcommittees are active: Radiation protection (France); Reactor safety (United Kingdom); and Radioisotopes (Poland).

The International Electrotechnical Commission has established a special nuclear energy project on electrical measurement instruments for radioisotope applications and personnel protection. The United States holds the secretariat for this project.

As indicated by the fact that many nations are joining together for economic cooperation in such groups as the European Economic Community, and also in such groups as the European Atomic Energy Community (Euratom) and the International Atomic Energy Agency, atomic energy is considered by practically every nation as an important factor in its industrial development, Mr McAdam pointed out. American industry, as the recognized leader in the atomic energy technology, has tremendous world trade opportunities. Standardization in this field, both at home and abroad, is almost certain to make the U.S. task an easier one, he said.

"The strength and stature of the United States atomic energy industry during the years ahead may depend on how well we do this job," Mr McAdam said. "United States organizations, through the ASA, must get solidly behind these programs if they are to be at all effective."

To solve major problems of outer space, we may need space vehicles that can be controlled from any country around the world and satellites that can be manufactured in one country and launched in another. This is the opinion of John P. Hagen, assistant director of program coordination of the National Aeronautics and Space Administration.

For the United States to launch a satellite made by another country, it is necessary to establish international standards that would make the mating of the various devices possible, both mechanically and electrically, Mr Hagen pointed out.

To control space vehicles from any point around the world, a high degree of standardization in electronic circuitry must be achieved, Mr Hagen said. An orbiting astronomical observatory, for instance, could then be launched, and ground teams of astronomers in the countries over which the satellite passes would be capable of taking over its operation.

Another future need for standardization will be in the field of fundamental measurements of length, mass, and time in space, Mr Hagen pointed out. Our best measurements today are based on observations of asteroids in their highly elliptical orbits, and these measurements may no longer be precise enough. However, as we gain the ability to place an instrumented satellite in an orbit around the sun and track it with precision, we can then improve our knowledge of the scale of distances and develop new standards, Mr Hagen said.

Alvin G. McNish, acting chief of the Division of Optics and Metrology, National Bureau of Standards, explained with the use of slides how the light waves of Krypton 86 lamps can be used as a highly accurate measure of length. The wavelength of the orange light from Krypton 86 is proposed as the international standard for all measurements. The International Committee on Weights and Measures is expected to vote its final adoption to replace the meter bar in 1960.

Now, the National Bureau of Standards is investigating the possibility of even greater accuracy through the use of the atomic beam which can be used either as an emission or an absorption source, or through the use of the Zeeman absorption filter. The Bureau's research in measurement techniques should soon make possible the routine calibration of industry's gage blocks to one ten-millionth of an inch.

SESSION 8

Should American Industry Convert to the Metric System?

Preparing for the exciting discussion on the metric system (left to right) J. M. Goldsmith, CMC Chairman, chairman of Session 8; Ralph M. Drews; R. W. Ernsberger; S. H. Watson, Radio Corporation of America, panel moderator.

Sponsor: Company Member Conference of ASA

IT IS AS IMPORTANT TO BE ACCURATE in the pharmaceutical field as it is in aircraft, commented R. W. Ernsberger, head of Pharmaceutical Development, Eli Lilly & Company, Indianapolis, Ind. The Lilly Company, which has activities throughout the world, has now changed over to the metric system except in its Basingstoke Plant in England. Pills and tablets are made to formulae which must be revised every couple of years, Mr Ernsberger explained. Under the former system, in which English measurements were used in English-speaking countries, it was necessary to have one man to revise the formula and another man to check his calculations. Now, using the metric system throughout, at least ½ hour is saved on each formula, he estimated. At $10 an hour, savings amount to $4,000 a year for this one operation alone. Other operations, such as inventory control, offer savings of even greater importance. And using the metric system makes pricing all the different products a straightforward operation. Also, the metric system reduces the possibility that the inventory clerk may make an error in making up the pharmaceutical preparations, Mr Ernsberger declared, since the factor of 10 makes it easy for the inventory clerk to make the necessary computations.

Of course, the Lilly Company cannot now buy all its materials according to the metric system; therefore, the company must convert those measurements which are not metric for its warehouse records. Mr Ernsberger believes, however, that a general change to the metric system has begun in this country, and that it is a good business venture to make the conversion.

Engineers in the aerospace industry are 94 percent in favor of changing to the metric system, according to Randolph Hawthorne, editor of *Space/Aeronautics*. Mr Hawthorne described the results of a survey conducted by his magazine. There are seven reasons for converting to the metric system, he finds:

1. The world trend is to the metric system.
2. The metric system is already the only legal system in the U.S.
3. Most engineers must spend time converting from English to metric and back, wasting several hundred thousand manhours per month in the aerospace industry alone.
4. Conversions within the English system — decimal inches to decimal feet, decimal pounds to decimal ounces — may be even more time-consuming.
5. Because of these conversion problems, accuracy of engineering computations is suspect.
6. Foreign trade to countries of the metric system suffers, other things being equal.
7. The metric system is a better mental tool and an aid to visualization of engineering problems.

Taking the opposite viewpoint, Ralph M. Drews, Republic Steel Corporation, told the conference that it would be just as confusing to change our language to Latin as to convert from the inch to the metric system of measure. Mr Drews is chief metallurgist of his company's fabricating divisions.

Among the objections to conversion listed by Mr Drews were: the necessity of re-educating the public; the cost of maintaining a dual system of replacement parts for old inch-based equipment and new metric-based equipment; the cost of retooling present equipment to produce metric-sized pipe, wire, bolts, containers, and so on; the unwieldy metric decimals that would result if present dimensions were converted to metric terms; the problem of providing for interchangeability of metric and inch parts; and benefit to foreign competitors in the U.S. market.

"If we were an exporting nation, then the adoption of the metric system might make sense," Mr Drews declared. "But even if we were, domestic versus export demand must be considered." "Today," he said, "the metric system is doing an excellent job in this country's laboratories — let's keep it there."

Victor Raviolo, executive director, Engineering Staff, Ford Motor Company, Dearborn, Mich., agreed with Mr Drews. We cannot afford to dissipate the amount of national wealth represented in the inch system by changing to the metric system, he said. There has been continuing discussion of the subject since John Quincy Adams started a study of it in 1817, he pointed out. But, he said, we have long since passed the point of no return. In his opinion, the Ford Motor Company would dissipate as much as one-sixth of the total assets of the

The session vice-chairman with a group of panelists on the metric system (left to right) Randolph Hawthorne; Victor Raviolo; D. F. Hollingsworth, E. I. du Pont de Nemours & Co, Inc, session vice-chairman; Colonel W. J. Darmody.

company if it decided to change to the metric system, with no advantage to the company, he said.

Colonel W. J. Darmody, assistant to the president, The Sheffield Corporation, Dayton, Ohio, believes that the metric system is coming gradually to this country. As an example, he called attention to the fact that Sears Roebuck have a whole shelf of metric wrenches for sale. However, he commented, the metric system should make its way on its own economic merits.

DISCUSSION

Following presentation of the panel papers, the meeting was thrown open for discussion.

One of those present commented that changeover to the decimal inch gives all the advantages of the metric system.

How is industry affected by a recent order that the U.S. Army change to the metric system, was one question.

Roy Trowbridge, General Motors, replied that the order applies only to range-finding instruments. All the ranges have been changed from yards to meters, he said, a change related to NATO activities. Heavy Army equipment has been metric for some time, but an inquiry has now been directed to the Army to determine its intentions with regard to the application of metric dimensions to tanks.

A suggestion was made that an entire system of measurements be developed based on the decimal system — in addition to the decimal inch — making it possible to increase measurements in multiples of 10.

It is impossible for people to accept the metric system in a short time, was one comment.

The source of the replies in favor of the metric system resulting from *Space/Aeronautics'* survey of the aeronautical industry was questioned, with the comment that "the hot-head answers a questionnaire circulated by a magazine." Mr Hawthorne explained that the replies came heavily from Boeing, Pratt and Whitney, and other major firms.

"This system is more than a measurement device — it is a communication device," one speaker commented. "There is a great deal of confusion because industry people have to convert the findings of the scientists, a problem that is becoming greater and greater as we get into the space age."

In reply, one speaker commented that the metric system itself falls short in the space field, because here the measurements are literally "out of this world."

Opponents of the changeover are talking about an immediate change, one member of the audience commented, whereas the problem involves a gradual change, in his opinion. The metric system can be learned, he pointed out; however, long experience has given everyone such easy familiarity with the inch system that it would require long use of the metric system to overcome the relative disadvantage of its use.

In reply to a question from the floor, Mr Ernsberger explained that it took Eli Lilly four years to introduce the metric system and have it accepted throughout the company. In order to start the program on a sound basis, the company asked the help of an industrial

Question on use of the metric system read from the floor during fast and interesting question-and-answer period amuses the Session 8 panel.

psychologist. Formulas were collected from each department, including both metric measurements and the converted measurements. The company experimented for an entire year before telling the employees what was going to be done. When the announcement was made, the company was happily surprised at the reception it received. However, Mr Ernsberger pointed out, anyone who considers making a change of any kind is faced with the problem of orienting people. Many people resist change. The changeover to the metric system cost the company $30,000, about $10,000 of which was in scales and conversion of measuring devices, and $20,000 in direct labor. Any system can be converted, Mr Ernsberger declared, but the conversion must first take place in the thinking of the people involved. The company believes that the benefits to the company will exceed the cost over a short period of time.

Mr Raviolo explained, however, that the Ford Company has an entirely different problem, in comparison with the problem of the Lilly Company. There are 10,750 people in the over-all engineering department, he pointed out, and the tests run by the engineering department are reported in English measurements, such as pounds per square inch (psi), not as simple to convert as the straightforward measurement of volume and weight. He pointed out that all workmen as well as engineers have built up immeasurable experience in thinking in the inch system.

J. M. Goldsmith, retiring chairman of the Company Member Conference, welcomes Dwight F. Hollingsworth (right), newly elected chairman.

THE COMPANY MEMBER CONFERENCE

D. F. HOLLINGSWORTH, principal standards engineer, E. I. du Pont de Nemours & Company, Wilmington, was elected chairman of the Company Member Conference at the meeting of the CMC Administrative Committee held during the conference. Mr Hollingsworth has been vice-chairman of CMC for the past year.

Newly elected vice-chairman is B. Scott Liston, standards administrator of the Diamond Alkali Company, Cleveland.

Four new members of the Administrative Committee took office at this meeting:

Ray J. Abele, Burroughs Corporation, Detroit, Mich.

(*Continued on page* 372)

Members of the Company Member Conference's Administrative Committee at one of the committee's sessions during the National Conference on Standards in Detroit: (left to right) R. V. Vittucci, Bureau of Ships, Department of the Navy; C. W. Straitor, Detroit Edison Company; P. J. Callan, Eastman Kodak Company; W. G. Waltermire, Lamson & Sessions Company; R. H. Fenn, Pitney-Bowes, Inc; D. F. Hollingsworth; E. I. du Pont de Nemours & Co; J. M. Goldsmith, Sheffield Division, Armco Steel Corp; Henry G. Lamb, American Standards Association; B. Scott Liston, Diamond Alkali Co; J. R. Welshman, Grinnell Company, Inc.

H. G. Arlt, Bell Telephone Laboratories, Murray Hill, N. J.

P. J. Callan, Eastman Kodak Company, Rochester, N. Y.

Charles W. Wright, Chrysler Corporation, Detroit, Mich.

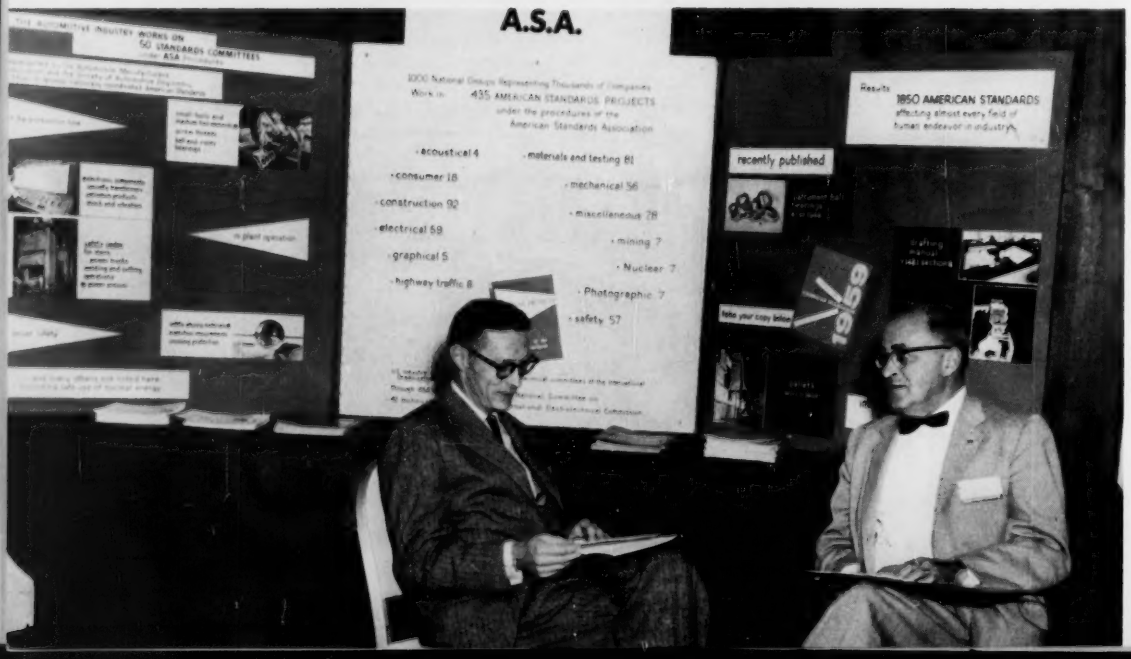
The Administrative Committee voted its deep appreciation to the four retiring members of the committee: F. H. Bump, Norton Company; D. F. Engstrom, Cutler-Hammer, Inc; A. E. Heyson, General Electric Company; R. V. Vittucci, Bureau of Ships, Department of the Navy. Special appreciation was expressed to J. M. Goldsmith, superintendent, Metallurgy and Quality Control, Sheffield Division, Armco Steel Corporation, Kansas City, Missouri, for his services as chairman during the past year.

At a ceremony during the final session of the conference, Vice Admiral G. F. Hussey, Jr, USN (Ret), managing director of the American Standards Association, took occasion to present a scroll to Mr Goldsmith in recognition of his services to ASA as chairman of the Company Member Conference. "ASA has had ample evidence of the effectiveness of the Company Member Conference," Admiral Hussey said in making the presentation. He emphasized that ASA stands willing at all times to be of any service possible to its company members and urged the CMC to continue to develop a strong program which will bring the American Standards Association and its company members more closely together in an effective national standards program.

The next meeting of the Company Member Conference—a two-day Spring Meeting—will be held at Philadelphia, April 2 and 3. The Administrative Committee has already started to plan the program and has assigned members to work on plans for individual sessions.

ASA's managing director, Vice Admiral G. F. Hussey, Jr (left), presenting scroll of ASA's appreciation to CMC's retiring chairman, J. M. Goldsmith.

BELOW: J. R. Walgren, Aluminum Company of America, a past chairman of the Company Member Conference, chats during the Conference with one of the new members of the CMC Administrative Committee—Herbert G. Arlt.



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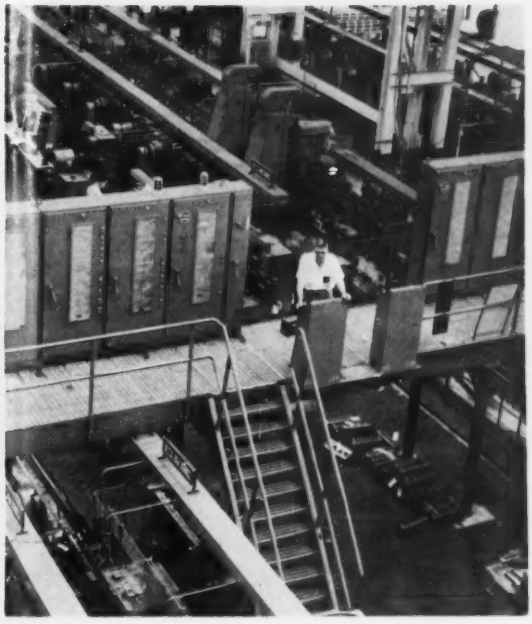

Chrysler's electric "Detecto" panels

THE CONFERENCE program committee had made arrangements for those attending the meeting to visit the Ordnance - Tank - Automotive Command, the Ford Motor Company's Rouge Plant, the Chrysler Corporation Engine Division, and the General Motors Technical Center.

Visitors to the Ordnance-Tank Automotive Command were briefed on the procedures and functions of the Data Processing Branch and witnessed the RCA BISMAC in action. This is the largest commercial data-processing system in the country.

The Ford Motor Company's Rouge Plant occupies a two-square-mile industrial area which includes blast furnaces, steel mill, foundries, pressed steel operations, engine-producing facilities, final assembly, and other operations.

The General Motors Technical Center occupies 330 acres, and provides facilities for the research staff, engineering staff, styling staff, and process development staff.

The Chrysler Corporation Engine Division Plant has many innovations to its credit, among them the automatic engine test, and the electric "Detecto" panels which pinpoint the exact position of any machining trouble along the line.

Aerial view of Ford Rouge Plant

General Motors Styling Auditorium

STANDARDS FOR SURVIVAL

by MAJOR GENERAL J. B. MEDARIS

SO MUCH ATTENTION HAS BEEN FOCUSED upon the external threats to our security that we have glossed over dangers which threaten the warp and woof of our society from within, perhaps because they are less obvious, perhaps because they have not been viewed in proper perspective. We have spent so much effort in expanding our technical and industrial capabilities that we may have been guilty of slighting our human resources. We have been so busy building a nation that we have forgotten the nation is only as great as the intellectual and ethical capacities of its citizens. Let me quote John Selden, who said: " 'Tis all as if they should make the standard for the measure we call a foot a Chancellor's foot. What an uncertain measure this would be! One Chancellor has a long foot, another a short foot, a third an indifferent foot. 'Tis the same thing in the Chancellor's conscience."

We have stabilized the dimension of a foot, but have we measured the human conscience? The very word "standard" seems foreign to the human personality. This is especially true in a society which has always put a premium on the right of the individual to be different. Fundamental to our position is devotion to our way of life. The dignity of the individual, which we cherish, if we lose the international competition into which we have involuntarily been drawn, would be subordinated to a position of subservience to a crass, all-powerful, and materialistic state. Yet in one of those paradoxes that

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GENERAL MEDARIS, Commanding General, U. S. Army Ordnance Missile Command, Huntsville, Alabama, presented this paper at the Award Dinner during the National Conference on Standards. He opened his remarks by congratulating the ASA for the success it has achieved "in furthering the standardization movement as a means of promoting the national economy and in obtaining recognition of approved American industrial and engineering standards here and abroad." He outlined his purpose in discussing "Standards for Survival" as an attempt to identify certain intangible factors which in his opinion are the keys to the nation's future welfare and progress. "In the course of this discussion I shall try to indicate some areas in which I believe new and greater emphasis must be applied if we are to reinforce our total defenses against the known and unknown challenges of the future," he said.

are typical of our times, we find an urgent requirement for standards of human conduct, of action and reaction, in areas which are hardly susceptible to the physical measurements which are of primary concern to you.

Let us look briefly behind the industrial standards to their broader implications. A standard provides a means by which to assure the performance of an item. The acceptance and use of standards involves both obligation and assurance. By necessity, the standard imposes restrictions upon the producer. He is expected to utilize specified materials and to apply specific skills and equipment in a certain way, the combination of which will guarantee a dependable item. The user is assured that he can rely upon the item to be what he expects. He knows that it will withstand stresses and strains, internal and external influences, and will function in accordance with predetermined characteristics within clearly established parameters.

The programs of your association are especially valuable to our progress in the missile and space industry, which occupies a position in the forefront of technological advances today. Possibly no other segment of industry makes better use of, or is as dependent upon, the nearly 1,800 standards which have been established largely by your efforts. I would caution, however, that developments in the missile and space fields are placing increasing demands upon equipment above and beyond the scope of existing standards. In some areas the flashing progress of science has outstripped our ability to produce hardware within the known state of the art — at least in quantities sufficient to the need.

My Command has met this problem squarely and has endeavored to develop adequate standards for Army missile systems. We have resorted to a fundamental research approach in establishing engineering practices and procedures that can be defined in exacting terms. The success of this approach can be judged from the more than 600 procedures and test methods that have been developed for missile equipment. Some of these standards have been determined by upgrading existing military or national standards. Others represent the extraordinary demands of the missile systems themselves. As an example, compare our requirement of no more than 60 particles of contamination, 50 to 100 microns in size, in a sample of hydraulic fluid, with the normal standard of several hundred particles of contamination fc. the same sample.

In addition to developing standards for physical properties of materials, we are continuously scrutinizing engineering, drafting, purchasing, quality control, and manufacturing practices to define areas in which standardization can be effectively applied. You will understand that missiles are not produced in quantities comparable to automobiles or television sets. Nevertheless, the fact that large quantities of identical parts or components can be employed in a single missile system permits the application of standards in the twin interests of efficiency and economy. As an illustration of the possible magnitude of these applications, I might point out that one system will require over 20,000,000 transistors of a single type. This is more than one-fourth the total national production of the transistor industry this year.

We have achieved greater uniformity and increased reliability in performance by standardization in missile production and procurement. We believe that the effectiveness of logistical support and the operational readiness of these modern weapons systems can be further enhanced by a higher degree of standardization. That is why my Command actively participates in the standards program of the Department of Defense, with the over-all objective of conserving manpower, industrial production facilities, raw materials, and funds. Of even greater importance to our mission is the potential saving of time, the one commodity we cannot replace.

The attainment of these objectives calls for a dynamic standardization program which has the following clearly defined mileposts:

First: adoption of the minimum number of sizes, types, or kinds of items and services essential to military operations.

Second: achievement of the optimum degree of interchangeability of component parts used in these items.

Third: development of standard terminology, codes, practices, and procedures to achieve common understanding and clear interpretation of the description of the items, practices, and procedures.

Finally: insuring that engineering and purchasing documents concerning items for which we have logistic responsibility are consistent with the scope and objectives of the Department of Defense standardization program.

Such a program is, in essence, an engineered approach to the solution of an engineering problem. It involves the application of trained intelligence and the exploitation of technology to develop satisfactory solutions. Because we are dealing with measurable quantities of physical things, we can anticipate results which will meet the stated objectives.

But let us ask an important question. Are there any similar programs to solve other problems that beset us today and that will arise in the days which lie ahead, problems largely in the realm of politics, education, religion — in fact in all aspects of human relationship? Have we engineered standards to take care of our agricultural surpluses, our inadequate educational structure, our "beatniks," our traffic mess?

On the contrary, there seems to be an inherent reluctance, if not active resistance, to the introduction of technological methods and philosophies in human equations.

Yet the absence of logical and dependable standards has cost us dearly. Most assuredly, any prolongation of that lack can cost us the international preeminence that we have attained, and which is now under serious challenge.

It seems to me that the situation demands that we immediately set about the task of re-establishing stand-

ards of human judgment and behavior in consonance with our national heritage.

The increased attention being paid to science and technology, and the dawning realization of their direct impact upon our international position, is one of the more healthy phenomena of our times. However, if we allow the pendulum of public support to swing so far in the direction of these disciplines that we neglect other needs fundamental to our national welfare, we shall lose the critical struggle on behalf of free men.

I suggest, therefore, that we look at a set of undisputed facts involved in our present dilemma and examine more closely the interrelationships which exist between them.

The first is that our civilization rests upon a foundation of scientific and technological developments. To maintain leadership requires that we encourage and support scientific progress.

The second fact is that scientific knowledge expands at an ever increasing rate. This derives from the intimate association between scientific discovery and previously acquired knowledge. The advent of the technological age in which we live was made possible by the enormous amount of basic scientific research carried on over the course of the last 50 to 100 years. The achievements we have registered so far in one exciting new field of human activity, the exploration of outer space, were made possible by research and development activities in many areas. More especially, much of the instrumentation used in the current program grew out of the exploratory rocket launchings conducted with the assistance of Army research and engineering teams in the period from 1946 to 1950.

Another fact is that the greater the store of accumulated knowledge, the faster is the rate of progress. To acquire knowledge obviously requires scientific investigation. In this respect, in the field of rocketry, our position is not at all satisfactory. We have been burning up the reserve of knowledge painstakingly accumulated in the years immediately prior to the period of actual missile development. We have not replenished that reserve at a rate commensurate with the expenditures. In our haste to meet the defense emergency which demanded long-range ballistic missiles, we have somewhat neglected the forward-looking research without which these complex programs cannot go forward beyond their immediate objectives.

Still another fact is that the direction of the search for new knowledge, as well as the fruits of that search, are completely unpredictable. We cannot foresee today what fields of technology will be most important, what new problems may arise, what new types of engineering may be in the ascendancy 10 or 15 years hence. Because two researchers were curious about the source of the sun's heat, we have thermonuclear reaction. Because another researcher chanced to observe the formation of a mold, we have penicillin. Who would have predicted 25 years ago that nuclear engineering would have attained the eminence it enjoys today? Who but a select and relatively unknown few would have dared to prophesy 10 years ago that we would be concerned now with the engineering problems related to outer space systems or with the biological and physiological problems of manned space travel?

Not only does each new contribution of science boost our scientific structure vertically, but, like the amputated head of the Hydra, it creates numerous problems clamoring for attention while offering new opportunities for discovery and progress. Each discovery in basic science opens up glittering possibilities for applied scientists and engineers to interpret the results and to devise ways and means of utilizing them to provide new products, new consumer goods, new elements in our standards of living. Inevitably, and to your special interest, the continuing process will also require the development of new standards.

Obviously, the lesson of benefits to be gained from exploiting technology has not been lost upon industry. The Department of Commerce has reported that industrial spending for applied research and development jumped from a level of $430 million in 1945 to $4½ billion in 1957. The outlay this year from both government and industry sources has been estimated at $10 billion. Dr Philip Marvin of the American Management Association has observed that "Corporations that are ahead usually stay ahead through research, and it is becoming increasingly difficult for late starters to catch up. Those corporations that can capture leadership within specific industries in the use of new technology can command their destinies."

What is true of industry is true also of the total progress of the nation. Unless we can retain our leadership in scientific and technological development, we cannot control our destiny. We shall most assuredly lose our position to the competition which is coming up fast.

There is another aspect to this dynamic force which requires consideration. In our understandable concern to increase the input of better prepared engineers and scientists, there seems to be a tendency to overlook the inexorable impact of an increasingly complex technology upon the labor force. Yet it is logical to expect that more and more routine processes will be performed by machines which must, in turn, be controlled and maintained by men. More technically trained manpower will be required by the devices associated with automation, nucleonics, electronics, and space. A higher level of training for greater numbers of people will assuredly be needed. The increase in productivity, made possible through the exploitation of technology, will increase individual leisure time. Here we face the challenge of finding ways to assure that free time is not completely wasted, which, in turn, requires the reversal of a trend already startlingly apparent. In fact, a broad and basic understanding of the physical sciences will be fundamental to the art of living, if man is to control the machines he builds and the natural forces at his command.

The unpredictability of the future sharply points up the need for a broader grasp of scientific principles

than our educational system generally provides. Even the man thoroughly versed in a narrow scientific or engineering field will almost certainly fall behind a few years hence. The lines of cleavage which once separated the learned disciplines, such as physics and chemistry, mechanics and electricity, are vanishing. There is increasing need for cross-over understanding among these various fields. Industry has begun to shy away from the extreme specialist. As one manager recently stated the problem, "We are turning more and more to the liberal arts schools. We want educated men; we can train a man but we cannot educate him."

And now I invite your attention to an indispensable and frequently ignored element in scientific and technical progress and, in truth, in all human progress of any kind. This is the ethical, moral, or religious basis for human behavior.

In a civilization dominated by technology, the highest moral and ethical standards must be established and preserved for the proper control and employment of personal, national, or international capabilities. If society as we understand it is to endure, ethical principles and considerations must govern the utilization of forces released for human use by technology. The problem is rendered more complex by the fact that these forces are presently also at the disposal of unscrupulous and potentially aggressive nations. The enormous power latent in nuclear fission or fusion can be controlled wisely only by improved human understanding and wisdom. The repugnant and wholly unacceptable alternative is an increasing struggle for superiority in the means of destruction, which would not only cost us any other progress but might wipe out the human race.

The growth of science rests upon moral and ethical principles. By its very nature, science is the search for truth. Creative science seeks to bring order out of apparent disorder. This, in turn, recognizes the existence of an ultimate and transcendent order that is in reality what we recognize as religion. Jesus of Nazareth expressed a basic tenet of science when He said: "Seek the truth and the truth shall make ye free."

But the search for truth demands a resolution that is difficult to maintain. A powerful set of contradictory influences are at work. Man finds himself hard-pressed to achieve that peace of mind which is essential to fulfillment and happiness. Knowledge is advancing faster than he can employ it. Progress opposes stability, and change becomes the normal state of affairs. What was new yesterday will be old tomorrow, and the span between is measured in days rather than years. While man's life span becomes longer, the cycle of time grows shorter, and one human being's allotted span reaches from gaslight to space travel. Machines and automation supersede the old manual skills. Man is challenged to develop and use the only capability that is uniquely his — the power of intelligent decision. As John Erskine put it, "We have a moral obligation to be intelligent."

Developed by education, intelligence has become the "gold standard" of the future. Men and nations seek to acquire the brains of others rather than their material resources, for no nation can retain a monopoly when limitless sources of energy are available to all who can convert them.

The measure of security is in constant flux. The conservation of that which is and has been, sometimes called "conservatism," comes to assure obsolescence and thus guarantees insecurity. The *status quo ante* disappears almost before it has been recognized as the *status quo*.

The choice between the constructive and the destructive, between the offensive and the defensive, between initiative and stabilization becomes the grim choice between life and death.

Yet amidst all this kaleidoscopic movement, the inner soul of man must find the eternal harbor he craves — some home port that will stay put, and around which he can move with the certainty of an eternal verity as his own haven of peace. When he fails to find and seize upon such an anchorage, his mind refuses the challenge of change. Mental illness becomes an epidemic of the times. Youth, cast afloat on uncharted seas, lacks assurance and embarks upon dangerous adventure. The cry of pain and insecurity rises from the aching hearts of the untrained and the untaught. "Where am I?" "Where am I going?" "Who and where is authority?" And the world is too busy to answer.

Yet the answer is there — the answer without which man becomes a scurrying animal without purpose or direction — fighting for the next morsel of food. The answer is in the majestic order of the universe, and its obedience to unchanging law; in the certainty and regularity of the seasons; in the majestic march of the sun, the moon, and the stars; in the regular coming of night and day; in the balance between man's consumption of life-giving oxygen and its production by the plant life of the earth; in the regularity of change from the stark and barren quiet of winter to the greening, growing life of spring; in the lively cry of a newborn babe, with its ever new demonstration of the miracle of human life.

This majestic order and obedience to unchanging law is a clear assurance of profound and unchallenged authority — an unmistakable sign of safe anchorage for the troubled spirit of man.

Increase in man's knowledge does not mean the discovery of new things, but only the extension of his understanding and ability to use that which already is, and has ever been. Like the growth of a child from infant to adult, man is discovering worlds new to him, but old to God.

When this is fully realized and accepted, and only then, man can stand straight and tall, assured and certain, in the face of troubled waters and howling winds, of change and apparent uncertainty, of lightning move from success to failure, from ease to difficulty, secure in his knowledge of the way to home port — at peace with himself because he is at peace with Almighty God. This, then, is the final and indispensable "standard for survival."

News Briefs...

• THE SOCIETY of Plastics Engineers has named William Lewi as its representative on ASA's Standards Council. Mr Lewi is secretary-treasurer of Dusal Tool & Mold Company, Inc; Long Island City, New York.

Blackstone Studios

William Lewi

Holder of a patent on vacuum-forming equipment, Mr Lewi is author of articles on the theory of cam action mold design for injection molds and the lenticular lens theory of three-dimensional viewing. He is a past officer and board member of SPE's New York section, and served as treasurer of the Society's national convention as well as first chairman of the Regional Technical Conference of SPE. He is a member of the Plastics Education Commission of the Advisory Board for Vocational Education, Board of Education, City of New York, and is also on the permanent advisory board for New York's Machine and Metal Trade High School.

• A NEW GUIDE for Loading Dry-Type Distribution and Power Transformers, C57.96, has been published by the American Standards Association as an appendix to the C57.12 series of American Standards for Power and Distribution Transformers.

The Guide, intended to facilitate the use of these American Standards but not a part of them, covers general recommendations for the loading of dry-type distribution and power transformers that have insulation systems limited to 150 C and 220 C maximum hottest-spot operating temperatures. It includes recommendations for both ventilated and sealed, nitrogen-filled, dry-type transformers.

Sections included cover basic loading conditions for normal life expectancy; loading transformers with moderate sacrifice of life expectancy; loading of transformers having a nominal rating; supplemental cooling; basis for calculations of temperatures, loss of life, and loads; and protective devices.

The Guide was prepared by the subworking group on guides for loading of the American Institute of Electrical Engineers' committee on transformers. It was submitted to ASA through Sectional Committee C57, Transformers, Regulators, and Reactors.

Guide for Loading Dry-Type Distribution and Power Transformers, C57.96, can be obtained at $1.35 a copy.

• ALTHOUGH L. J. Markwardt has retired as assistant director of the Forest Products Laboratory, he has not retired from active work on standards. He is continuing as a member of ASA's Construction Standards Board and as chairman of the Sectional Committee on the Safety Code for the Construction, Care, and Use of Ladders, A14. He also plans to continue other technical activities and will serve as consultant for several industrial concerns in the forest products field. Mr Markwardt joined the staff of the Laboratory two years after it had been founded by the Forest Service of the U.S. Department of Agriculture in cooperation with the University of Wisconsin. He has been engaged in a combination of research, administration, and education to improve the general understanding of wood as an engineering material.

Mr Markwardt was selected by the American Society for Testing Materials to deliver the Edgar Marburg Lecture in 1943, and in 1950 was elected national president of ASTM.

He has represented the United States on several occasions at European meetings of world-wide research groups, such as the United Nations Food and Agriculture Organization conferences on wood technology.

For many years he has been active in ASTM's Committee D-7 on Wood, and has served as chairman for the past 12 years.

Mr Markwardt holds appointments to the Building Materials Advisory Board and Research Advisory Board of the National Research Council—National Academy of Science. At present he is chairman of the U.S. program committee charged with the development of the technical forest products program for the Fifth World Forestry Congress to be held at Seattle in 1960 under the auspices of the State Department.

• FEDERAL SPECIFICATION L-F-310, May 9, 1958, for Film, Dental Radiographic; Film, Photofluorographic, Medical; Film, Radiographic, Medical, is an excellent document based on specifications approved by the American Standards Association, reports George C. Paffenbarger, D.D.S., in an article published in the September 1959 issue of the *Journal of the American Dental Association*.

• STANDARDIZATION of ball and roller bearings was the subject discussed by Technical Committee 4 of the International Organization for Standardization (ISO) at its seventh meeting in Berlin, October 5-10.

Thirteen member countries were represented by some 60 delegates. The USA was represented by five delegates and one observer.

In preparation for the plenary session, four working groups met during the week before the meeting to discuss the standardization of instrument bearings and tapered roller bearings, as well as the more general subjects of tolerances and coding for identification purposes.

The Swedish member-body, as secretariat of ISO/TC 4, reported approval by the ISO Council of a number of ISO recommendations resulting from the work of TC 4. These are on boundary dimensions, tolerances, load ratings, and accessories.

Progress was made during the meeting in the work on instrument bearings and tapered roller bearings.

Airframe bearings were considered and a working group was appointed to deal with needle roller bearings.

The next meeting of ISO/TC 4 will be held in Turin, Italy, in the spring of 1961.

• *AMERICAN MACHINIST's* special report for August 19, 1959, covers surface-finish measurement on nonferrous materials. The report analyzes the problem, using the American Standard B46.1-1955 as the basis for its discussion and listing the instruments that are now available for carrying out the required measurements. The primary methods of defining surface finish in use today by design engineers are discussed.

The report was written by Bradley Piper, supervisor, and William P. Callis, technician, Aircraft Engine Operations, Allison Division, Gage Control Department, General Motors Corporation, Indianapolis, Ind.

In conclusion, the authors state that the American Standard is the common standard throughout the United States, is well defined and accurate. "However," they say, "we feel that there are two disadvantages to the practical use of this system. First, a good deal of confusion can result from misinterpretation of the numbers surrounding the symbol. In some cases the roughness-width rating has been mistaken for the roughness-height ratings, etc. Nor is there any place in the symbol for indicating the maximum permissible number of flaws; this number must be noted elsewhere on the engineering drawing.

"The second disadvantage grows out of the first. Because of the complexity of the complete symbol, the trend has been to omit all figures except the roughness-height rating —leaving the machinist to guess exactly what the engineer had in mind. Should the surface be turned, ground, or honed? A good specification would leave no room for doubt."

The authors include some suggestions for changes in the standard.

Copies of Special Report No. 476, August 10, 1959, can be obtained from the Reader Service Department, *American Machinist*, 330 West 42 Street, New York 36, N. Y. Single copies are 35 cents.

WHAT DID THEY REALLY SAY?

If you were interested in the samples of ideas presented at the National Conference on Standards (pages 356-373), read what the speakers really said — complete text with report of discussions in the

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Just Published . . .

DRAWINGS, SYMBOLS AND ABBREVIATIONS

Graphical Symbols for Welding, Y32.3-1959 [Revision of Z32.2.1-1949 (R1953)] $3.00
Sponsors: American Society of Mechanical Engineers; American Institute of Electrical Engineers

ELECTRIC AND ELECTRONIC

Electrical Indicating Instruments, Panel, Switchboard, and Portable Instruments, Requirements for, C39.1-1959 (Revision of C39.1-1955) $2.50
Sponsor: Electrical Standards Board

GAS-BURNING APPLIANCES

Domestic Gas Clothes Dryers, Z21.5-1959 (Revision of Z21.5-1956, Z21.5a-1957, Z21.5b-1958) $2.00
Minimum limiting construction and performance requirements and test methods to ensure safe operation, durable construction, and acceptable performance for domestic gas clothes dryers for use with natural, manufactured, and mixed gases; for use with liquefied petroleum gases; or for use with LP gas-air mixtures.

Central Heating Gas Appliances, Volume I, Steam and Hot Water Boilers, Z21.13.1a-1959 (Addenda to Z21.13.1-1958) $0.25
Minimum limiting construction and performance requirements and test methods to ensure safe operation, durable construction, and acceptable performance for boilers for use with natural, manufactured, and mixed gases; for use with liquefied petroleum gases; or for use with LP gas-air mixtures.
Sponsor: American Gas Association

MECHANICAL

High Speed Steel and Cast Nonferrous Single Point Tools and Tool Holders, B5.29-1959 $1.00
Covers sizes and tolerances of high speed steel and cast nonferrous tool bits used in general-purpose machining, and their holders.
Sponsors: American Society of Tool Engineers; Society of Automotive Engineers; National Machine Tool Builders' Association; Metal Cutting Tool Institute; American Society of Mechanical Engineers

PHOTOGRAPHY

Diffuse Transmission Density, PH2.19-1959 (Revision of Z38.2.5-1946) $1.80
Sponsor: Photographic Standards Board

Method for Determining Performance Characteristics of Front Shutters Used in Still Cameras, PH3.4-1959 (Revision of PH3.4-1952) $0.50
Sponsor: Photographic Standards Board

PIPE AND FITTINGS

Seamless Carbon-Steel Pipe for High-Temperature Service, Specifications for, ASTM A 106-58T; ASA B36.3-1959 (Revision of ASTM A 106-55T; ASA B36.3-1956) $0.30
Covers seamless carbon-steel pipe for high-temperature service of nominal (average) wall thickness and suitable for bending, flanging, and similar forming operations.

Electric-Fusion (Arc)-Welded Steel Pipe (Sizes 4 in. and Over), Specifications for, ASTM A 139-58T; ASA B36.9-1959 (Revision of ASTM A 139-55; ASA B36.9-1956) $0.30
Covers two grades of electric-fusion (arc)-welded straight or spiral-seam steel pipe 4 in. and over in diameter with nominal wall thicknesses up to ⅝ in.

Medium-Carbon Seamless Steel Boiler and Superheater Tubes, Specifications for, ASTM A 210-58T; ASA B36.15-1959 (Revision of ASTM A 210-55T; ASA B36.15-1956) $0.30
Covers seamless steel boiler tubes and boiler flues, including safe ends, arch and stay tubes, and superheater tubes.

Welded and Seamless Open-Hearth Iron Pipe, Specifications for, ASTM A 253-58; ASA B36.23-1959 (Revision of ASTM A 253-55T; ASA B36.23-1956) $0.30
Covers black and galvanized seamless, furnace butt-welded, and electric-resistance-welded open-hearth iron pipe, of average wall thickness and intended for coiling, bending, flanging, and other special purposes.

Seamless Low-Carbon and Carbon-Molybdenum Steel Still Tubes for Refinery Service, Specifications for, ASTM A 161-58T; ASA B36.27-1959 (Revision of ASTM A 161-55T; ASA B36.27-1956) $0.30
Covers seamless, hot-rolled and cold-drawn, low-carbon and carbon-molybdenum steel still tubes, 2 in. and over in minimum wall thickness for use at elevated temperatures and pressures in various types of oil stills, where tubes may be subjected to temperatures greater than that of the fluid contained.

Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 179-58T; ASA B36.28-1959 (Revision of ASTM A 179-56T; ASA B36.28-1958) $0.30
Covers seamless cold-drawn low-carbon steel tubes for tubular heat exchangers, condensers, etc, in sizes ½ in. up to but not including 2-in. outside diameter.

Seamless Cold-Drawn Intermediate Alloy-Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 199-58T; ASA B36.29-1959 (Revision of ASTM A 199-56T; ASA B36.29-1958) $0.30
Covers several grades of chromium-molybdenum and chromium-molybdenum-silicon seamless cold-drawn intermediate alloy-steel exchanger and condenser tubes, in sizes ½ in. to but not including 2-in. outside diameter.

Seamless Intermediate Alloy-Steel Still Tubes for Refinery Service, Specifications for, ASTM A 200-58T; ASA B36.30-1959 (Revision of ASTM A 200-55T; ASA B36.30-1956) $0.30
Covers several grades of chromium-molybdenum and chromium-molybdenum-silicon seamless, hot-rolled and cold-drawn intermediate alloy-steel still tubes, 2 in. and over in outside diameter and thicker than 0.220 in. minimum wall for use at elevated temperatures and pressures and where the tubes may be subjected to a temperature higher than that of the fluid.

Seamless Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes, Specifications for, ASTM A 209-58T; ASA B36.31-1959 (Revision of ASTM A 209-55T; ASA B36.31-1956) $0.30
Covers three grades of seamless carbon-molybdenum alloy steel boiler tubes and superheater tubes.

Electric-Resistance-Welded Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes, Specifications for, ASTM A 250-58T; ASA B36.34-1959 (Revision of ASTM A 250-55T; ASA B36.34-1956) $0.30
Covers three grades of electric-resistance-welded, carbon-molybdenum alloy-steel boiler and superheater tubes.

Seamless and Welded Steel Pipe for Low-Temperature Service, Specifications for, ASTM A 333-58T; ASA B36.40-1959 (Revision of ASTM A 333-55T; ASA B36.40-1956) $0.30
Covers nominal (average) wall seamless and welded carbon and alloy steel pipe for use at low temperatures. Four grades of ferritic steel are included.

Seamless and Welded Steel Tubes for Low-Temperature Service, Specifications for, ASTM A 334-58T; ASA B36.41-1959 (Revision of ASTM A 334-55T; ASA B36.41-1956) $0.30
Covers minimum wall seamless and welded carbon and alloy steel tube for use at low temperatures, three ferritic grades are included.
Sponsors: American Society of Mechanical Engineers; American Society for Testing Materials

SAFETY

Safety Code for the Installation and Operation of Pulverized-Fuel Systems, NFPA No. 60; ASA Z12.1-1959, 2nd ed. (Revision of Z12.1-1959) $0.50
Prevention of dust explosions through safety of design, construction, installation and operation of equipment for pulverizing and burning pulverized coal, coke, lignite, and anthracite (except Pennsylvania anthracite and fuels of similar characteristics).

Safety Code for the Prevention of Dust Explosions in Starch Factories, NFPA No. 61A; ASA Z12.2-1959, 2nd ed. (Revision of Z12.2-1959) $0.50
Prevention of dust explosions in the handling of dried starch in starch factories, through all processes from the kilns up to and including the packing operations.

Safety Code for the Prevention of Dust Explosions in Flour and Feed Mills, NFPA No. 61C; ASA Z12.3-1959 (Revision of Z12.3-1956) $0.50
Prevention of dust explosions to minimize the resulting damage in case of explosions, and to minimize fire hazards. Covers structural features of buildings, ventilation and construction, installation and operation of equipment.

Safety Code for the Prevention of Dust Explosions in Terminal Grain Elevators, NFPA No. 61B; ASA Z12.4-1959 (Revision of Z12.4-1956) $0.50
Prevention of dust explosions to minimize the resulting damage in case of explosion, and to minimize fire hazards in terminal grain elevators. Covers structural features of building, ventilation, and construction, installation and operation of equipment.

Safety Code for the Prevention of Dust Explosions in Woodworking Plants, NFPA No. 663; ASA Z12.5-1959 (Revision of Z12.5-1953) $0.50
Prevention of dust explosions to minimize the resulting damage in case of explosion and to minimize fire hazards. Covers the hazards involved in the production of finely divided wood particles in the course of woodworking operations, removal of these particles, and subsequent disposal.

Safety Code for the Prevention of Dust Explosions in Sugar and Cocoa Pulverizing Systems, NFPA No. 62; ASA Z12.6-1959, 2nd ed. (Revision of Z12.6-1959) $0.40
Prevention of the hazards inherent in the manufacture of pulverized sugar and cocoa, particularly the hazard of their ignition and the propagation of a resulting fire. Deals particularly with control of dust.

Safety Code for the Prevention of Dust Explosions in Coal Preparation Plants, NFPA No. 653; ASA Z12.7-1959, 2nd ed. (Revision of Z12.7-1959) $0.50
Prevention of dust explosions in the operation of plants designed to clean, wash, and dry fine coal for marketing purposes (as distinguished from coal pulverizers at power-generating plants). Covers construction and arrangement of buildings, ventilation and dust collection, coal drying and storage, and fire and explosion protection.
Sponsor: National Fire Protection Association

Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, Z33.1-1959 (Revision of Z33.1-1950) $0.50
Requirements for elimination or reduction of fire and explosion hazards inherent in the operation of blower and exhaust systems, and requirements for preventing the spreading of fire.
Sponsor: National Fire Protection Association

...In Process

As of November 20, 1959

ACOUSTICS, VIBRATION, AND MECHANICAL SHOCK

In Board of Review

Calibration of Shock and Vibration Pickups, Methods for, S2.2-
Sponsors: Acoustical Society of America; American Society of Mechanical Engineers

BUILDING AND CONSTRUCTION

In Standards Board

Dry-Set Portland Cement Mortar, Specification for, A118.1-
Sponsor: Tile Council of America

DRAWINGS, SYMBOLS AND ABBREVIATIONS

In Standards Board

Letter Symbols for Feedback Control Systems, Y10.13-
Sponsor: American Society of Mechanical Engineers

Time Series Charts, Y15.2- [Revision of Z15.2-1938 (R1947)]

Sponsor: American Society of Mechanical Engineers

ELECTRIC AND ELECTRONIC

American Standards Approved

Insulation Resistance of Electrical Insulating Materials, Methods of Test for, ASTM D 257-58; ASA C59.3-1959 (Revision of ASTM D 257-54T; ASA C59.3-1955)

Woven Cotton Tapes for Electrical Purposes, Specifications for, ASTM D 335-51; ASA C59.39-1959

Sponsor: American Society for Testing Materials

4-Watt T-5 Preheat-Start Fluorescent Lamp, Dimensional and Electrical Characteristics of, C78.400-1959 (Revision of C78.400-1951)

Sponsor: Electrical Standards Board

In Standards Board

Industrial Control Apparatus, C19.1- (Revision of C19.1-1943)

Sponsors: American Institute of Electrical Engineers; National Electrical Manufacturers Association

Electrical Insulating Oils, Methods of Testing, ASTM D 117-58; ASA C59.2 Revision of ASTM D 117-54T; ASA C59.2-1955)

Sheet and Plate Materials Used for Electrical Insulation, Methods of Testing, ASTM D 229-58; ASA C59.13- (Revision of ASTM D 229-49; ASA C59.13-1951)

Power Factor and Dielectric Constant of Electrical Insulating Oils of Petroleum Origin, Methods of Test for, ASTM D 924-58; ASA C59.22- (Revision of ASTM D 924-49; ASA C59.22-1951)

Plastics and Electrical Insulating Materials for Testing, Methods of Conditioning, ASTM D 618-58; ASA C59.28- (Revision of ASTM D 618-54; ASA C59.28-1955)

Sponsor: American Society for Testing Materials

Outlet Receptacles, Attachment Plug Caps, and Appliance Plugs, C73.1a- (Supplement to C73.1-1957)

Sponsor: National Electrical Manufacturers Association

72-Inch (800 and 1000 Milliampere) T-12 Rapid-Start Fluorescent Lamps, Dimensional and Electrical Characteristics of, C78.701- (Consolidation and revision of C78.701-1956 and C78.703-1958, 2nd edition)

96-Inch (800 Milliampere) T-12 Rapid-Start Fluorescent Lamps, Dimensional and Electrical Characteristics of, C78.702- (Revision of C78.702-1958, 2nd edition)

96-Inch (1.5 Ampere) T-12 and PG-17 Rapid-Start Fluorescent Lamps, Dimensional and Electrical Characteristics of, C78.707-

Sponsor: Electrical Standards Board

Reaffirmation Approved

6-Watt T-5 Preheat-Start Fluorescent Lamp, Dimensional and Electrical Characteristics of, C78.401-1951 (R1959)

8-Watt T-5 Preheat-Start Fluorescent Lamp, Dimensional and Electrical Characteristics of, C78.402-1951 (R1959)

30-Watt T-8 Preheat-Start Fluorescent Lamp, Dimensional and Electrical Characteristics of, C78.407-1951 (R1959)

42-Inch T-6 Instant-Start Single Pin Hot-Cathode Fluorescent Lamp, Dimensional and Electrical Characteristics of, C78.801-1951 (R1959)

64-Inch T-6 Instant-Start Single Pin Hot-Cathode Fluorescent Lamp, Dimensional and Electrical Characteristics of, C78.803-1951 (R1959)

8-Watt T-5 Bactericidal Lamp, Dimensional and Electrical Characteristics of, C78.1200-1951 (R1959)

15-Watt T-8 Bactericidal Lamp, Dimensional and Electrical Characteristics of, C78.1201-1951 (R1959)

30-Watt T-8 Bactericidal Lamp, Dimensional and Electrical Characteristics of, C78.1202-1951 (R1959)

Sponsor: Electrical Standards Board

American Standards Withdrawn

20-Millimeter 52-Inch Cold-Cathode Fluorescent Lamp, C78.1100-1951

20-Millimeter 64-Inch Cold-Cathode Fluorescent Lamp, C78.1101-1951

20-Millimeter 76-Inch Cold-Cathode Fluorescent Lamp, C78.1102-1951

20-Millimeter 84-Inch Cold-Cathode Fluorescent Lamp, C78.1103-1951

20-Millimeter 93-Inch Cold-Cathode Fluorescent Lamp, C78.1105-1951

Sponsor: Electrical Standards Board

MATERIALS HANDLING

American Standards Approved

Metal Drums and Pails, Specifications for, MH2.1-1959 through MH2.10-1959 (Revision of MH2.1-1958 through MH2.10-1958)

Sponsor: Steel Shipping Container Institute

Shipping Cases for Petroleum Containers, MH7.1-1959

Sponsor: Petroleum Packaging Committee—Packaging Institute

MECHANICAL

American Standard Approved

Rotating Air Cylinders and Adapters, B5.5-1959 (Revision of B5.5-1954)

Sponsors: American Society of Tool Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers; American Society of Mechanical Engineers

Reaffirmation Approved

Preferred Thicknesses for Uncoated Thin Flat Metals (Under 0.250 in.), B32.1-1952 (R1959)

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Reaffirmation Being Considered

Round Head Bolts, B18.5-1952

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Withdrawal Being Considered

Screw Threads for High-Strength Bolting, B1.4-1945

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

PHOTOGRAPHY

In Board of Review

Photographic Chemical Scales, Specifications for, PH4.27- (Partial revision of Z38.8.9-1946)

Sponsor: Photographic Standards Board

In Standards Board

Threaded Lens Mounts for 16mm and 8mm Motion Picture Cameras, PH22.76- (Revision of PH22.76-1951)

Sponsor: Society of Motion Picture and Television Engineers

PIPE AND FITTINGS

In Standards Board

Cast Bronze Solder-Joint Drainage Fittings, B16.23- (Revision of B16.23-1955)

Sponsors: American Society of Mechanical Engineers; Mechanical Contractors of America, Inc; Manufacturers Standardization Society of the Valve and Fittings Industry

Wrought-Steel and Wrought-Iron Pipe, B36.10- (Revision of B36.10-1950)

Sponsors: American Society for Testing Materials; American Society of Mechanical Engineers

SAFETY

American Standards Approved

Safety Code for the Prevention of Dust Explosions in Wood Flour Manufacturing Establishments, NFPA No. 662; ASA Z12.8-1959 (Revision of Z12.8-1946)

Safety Code for the Prevention of Dust Ignitions in Spice Grinding Plants, NFPA No. 656; ASA Z12.9-1959 (Revision of Z12.9-1953)

Safety Code for the Prevention of Dust Explosions in the Manufacture of Aluminum Bronze Powder, NFPA No. 651; ASA Z12.11-1959 (Revision of Z12.11-1953)

Safety Code for the Prevention of Sulfur Fires and Explosions, NFPA No. 655; ASA Z12.12-1959 (Revision of Z12.12-1950)

Safety Code for the Prevention of Dust Ignitions in Country Grain Elevators, NFPA No. 64; ASA Z12.13-1959 (Revision of Z12.13-1956)

Safety Code for Explosion and Fire Protection in Plants Producing or Handling Magnesium Powder or Dust, NFPA No. 652; ASA Z12.15-1959 (Revision of Z12.15-1953)

Safety Code for the Prevention of Dust Explosions in the Plastics Industry, NFPA No. 654; ASA Z12.16-1959 (Revision of Z12.16-1946)

Safety Code for the Prevention of Dust Explosions in Confectionery Manufacturing Plants, NFPA No. 657; ASA Z12.18-1959 (Revision of Z12.18-1953)

Safety Code for Processing and Finishing of Aluminum, NFPA No. 65; ASA Z12.19-1959

Sponsor: National Fire Protection Association

In Board of Review

Safety Code for Head, Eye, and Respiratory Protection, Z2.1- (Revision of Z2-1938)

Sponsors: National Bureau of Standards; U. S. Department of the Navy; U. S. Bureau of Mines

In Standards Board

Safety Code for Window Cleaning, A39.1- (Revision of A39-1933)

Sponsor: National Safety Council

NEWS ABOUT AMERICAN STANDARDS PROJECTS

Safety Code for Floor and Wall Openings, Railings and Toe Boards, A12—

Sponsor: National Safety Council

It is planned to reorganize this committee as a first step toward a review of American Standard A12-1932 to determine whether it is adequate to meet today's needs, says James M. Christie, recently appointed secretary of the committee. Mr Christie is staff representative of the National Safety Council. His industrial department staff assignments are in the Glass and Ceramics Section and in the Cement, Quarry, and Mineral Aggregates Section. Before joining the staff of the National Safety Council, he worked for six years with E. I. du Pont de Nemours & Company. He was educated at the University of Louisville. Mr Christie is also secretary for Sectional Committee M28, Safety in Quarry Operations.

James M. Christie

Rock Dusting Coal Mines To Prevent Coal Dust Explosions, M13—

Sponsor: American Institute of Mining, Metallurgical, and Petroleum Engineers

Reorganization of the committee is now under way, with the appointment of John Nagy as chairman and R. W. Stahl as secretary. Mr Nagy is chief, Branch of Dust Explosions, Health and Safety, Research and Testing Center, Bureau of Mines, Pittsburgh. Mr Stahl is also with the Bureau.

In his work at the Bureau, Mr Nagy has participated in research on the causes of coal and gas explosions and means for preventing them, suppression and control of mine fires, distribution of rock dust, allaying of dust, float dust transport and deposition, and safe blasting practices. He has also been associated with studies made on dust explosion hazards in industry — their causes, means for prevention, and alleviation of their destructive effects. Mr Nagy is a graduate of the Carnegie Institute of Technology, with an M.S. in physics. He is author or co-author of about 30 research papers on dust explosion hazards and methods of preventing them.

John Nagy

Sizes of Shipping Containers, MH5—

Sponsors: American Material Handling Society; American Society of Mechanical Engineers

A length module of 10 feet for van freight containers was recommended at a meeting of the committee October 28. The nominal sizes selected were 10, 20, 30, and 40 feet with a cross section of 8 x 8 feet, according to Herbert H. Hall, consulting engineer of Pittsburgh, Pa., committee chairman.

The objective of the committee's work is integrated transportation through interchangeability of pallet containers, cargo containers, and van containers. The committee reported progress in the areas of handling, dimensioning, and methods of integrating the modular series with rail, highway, and marine transportation equipment.

The committee voted to ask the American Standards Association to request the International Organization for Standardization to initiate an international standardization program in this field.

The unofficial recommendations adopted at the meeting will be circulated to the more than 60 trade associations, technical societies, and government agencies represented on the committee for letter ballot.

Radiation Protection, N7—

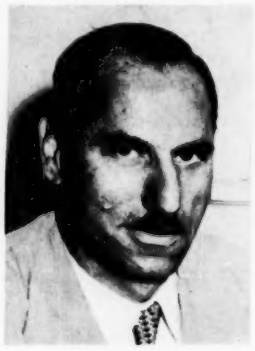
Sponsors: Atomic Industrial Forum; National Safety Council

At its meeting on October 28, the committee discussed and completed a final draft of a safety code for uranium mines and mills (concentrators). The draft is being sent to letter ballot of the committee.

Principles Underlying Valid Certification and Labeling of Commodities, Z34—

Sponsor: Association of Consulting Chemists and Chemical Engineers

The new chairman of Sectional Committee Z34, Martin Aaron, materials consultant, comments on the fact that the American Standard Practice for Certification Procedures, Z34.1-1947, was reaffirmed as up to date in 1959. This standard is just as valid today as it was when it was first promulgated, Mr Aaron says. "It is my own view that, like any standard of ethics, the actual observance may well be studied to determine whether more than lip service is being paid to it."



Martin Aaron

Mr Aaron serves as materials consultant to chemical manufacturers, plastics and metal fabricators, and consumer product manufacturers. He was formerly vice-president and director of the American Standards Testing Bureau, Inc, and has been vice-president of the American Plastics Corporation.

NEW INTERNATIONAL RECOMMENDATIONS

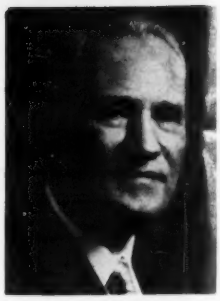
ISO Recommendations are published by the International Organization for Standardization, and IEC Publications are issued by the International Electrotechnical Commission, Geneva, Switzerland. Copies are available from ASA.

INTERNATIONAL ELECTROTECHNICAL VOCABULARY. GROUP 31: SIGNALLING AND SECURITY APPARATUS FOR RAILWAYS. *IEC Publication* 50 (31). 1959. *Second edition.* $3.20. Contains approximately 145 terms and definitions in French and English, with the equivalent terms in Dutch, German, Spanish, Italian, Polish, and Swedish. Indexes are provided for each of the eight languages used.

The terms and definitions are divided into the following sections: general terms; interlocking and interlocking boxes; block (or sectionalizing of trains); marshalling yard boxes; miscellaneous equipment.

CLASSIFICATION AND DEFINITIONS OF DIAGRAMS AND CHARTS USED IN ELECTROTECHNOLOGY. *IEC Publication* 113. 1959. *First edition.* $1.20. Defines and classifies diagrams, and the charts referring to them used in electrotechnology, in order to explain or show connections. These recommendations do not apply to plans or drawings giving installation information and showing the exact location of machines, apparatus, and conductors. Two kinds of classification have been adopted: (1) Classification according to purpose; (2) Classification according to method of representation.

RECOMMENDATION FOR HEAT-TREATED ALUMINUM ALLOY BUS-BAR MATERIAL OF THE ALUMINUM-MAGNESIUM-SILICON TYPE. *IEC Publication* 114. 1959. *First edition.* $0.80. Lays down the electrical and mechanical properties of heat-treated aluminum alloy busbar material of the Al-Mg-Si type.



by **Cyril Ainsworth**

DINNSA

(Does Industry Need a National Standards Agency?)

THE THIRD METHOD OF APPLYING THE BASIC PRINCIPLES of ASA procedures for the development and approval of standards is the General Acceptance Method. It is not as well known as the Sectional Committee Method and the Existing Standards Method, but has been used effectively in a limited number of cases.

Under the General Acceptance Method, national standards are produced solely by means of a conference of those substantially concerned, supplemented by a sufficiently large number of written acceptances of the recommendation agreed upon by the conference to indicate a consensus. The method is intended for simple cases and those in which organization of a sectional committee is judged unnecessary.

The method can best be seen in full perspective by an outline of the procedures followed in several cases. The very divergent fields of inch-millimeter conversion factor, cooking and baking utensils, and decimal dimensioning scales offer good examples.

In March 1932, ASA was requested to submit to American industry the question whether the value 25.4 should be adopted as the conversion ratio between inch-millimeter values for industrial use. Among the reasons given in support of the proposal were that the ratio 25.4 had been widely used in industrial practice for many years; and that the difference between the value 25.4 and the American legal ratio 25.40005 was so small that it had to be taken into account only in the manufacture of gage blocks of the very highest precision. ASA appointed a special committee to review the request and determine the procedure method to be used.

The General Acceptance Method was chosen and a general conference of industrial, technical, and governmental groups known to be substantially concerned was convened to consider the proposal. The conference, in a single session of half a day duration, recommended approval not only of the 25.4 ratio, but also of three conversion tables based on the ratio, supplemented by rules for conversion practice. These recommendations were submitted by letter ballot to industrial, technical, and governmental groups for formal acceptance. ASA, finding that the canvass had shown a consensus of acceptance, approved them as American Standard.

In September 1948, the American Home Economics Association submitted a request to ASA for initiation of a project on standardization of terminology, sizes, measurements, and markings of baking and cooking utensils. AHEA had prepared a proposed standard based on a study conducted over a two-year period covering every available cooking utensil, their materials, sizes and tolerances. This was offered as a basis for development of an American Standard. Because of the amount of work already carried on, it was decided to use the General Acceptance Method.

The general conference considered the standards of AHEA, approved them in principle, and appointed a subcommittee to redraft certain sections. The subcommittee reported to a second session of the conference, which approved the new draft and recommended that it be circulated by letter ballot for formal acceptance. ASA, finding a consensus of acceptance, approved the standard as American Standard.

(To be continued next month)

Is It a WORK INJURY?

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